M55 GB/VX ROCKET

ASSESSMENT PLAN

DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND
ROCK ISLAND, ILLINOIS 61299

M55 GB/VX ROCKET

STOCKPILE ASSESSMENT PLAN

18 MARCH 1985

PREPARED AT THE DIRECTION OF

OF

DEPUTY CHIEF OF STAFF FOR NUCLEAR & CHEMICAL MATTERS,

ARMY MATERIEL COMMAND

BY

M55 FUNCTIONAL TASK GROUP

REPRESENTING: US ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND (AMCCOM); US ARMY DEPOT SYSTEMS COMMAND (DESCOM); US ARMY TOXIC & HAZARDOUS MATERIALS AGENCY (USATHAMA); US ARMY MATERIEL SYSTEMS ANALYSIS ACTIVITY (AMSAA); US ARMY MATERIALS AND MECHANICS RESEARCH CENTER (AMMRC); AMC FIELD SAFETY ACTIVITY (FSA)

REVISION 1, DATED 18 MAR 85, SUPERSEDES BASIC DATED 21 SEP 84 W/CH2

1. PURPOSE: The purpose of this plan is to delineate the procedures, methods of analysis, and milestones for assessment of the M55 GB/VX rocket stockpile to allow a determination for future disposal actions.

2. BACKGROUND: The M55 GB rockets, which were filled at Rocky Mountain Arsenal (RMA) from 1961 to October 1965, have recently been declared obsolete and designated for disposal. The M55 VX rockets were manufactured and loaded at Newport Army Ammunition Plant in 1964 and 1965. These items have posed particular challenges for the Army in view of the potential hazards posed during storage, movement, or disposal. Disposal operations require a significant investment in manpower and facilities, and of late, have roused environmental concerns within the civilian community. The approach to conducting disposal operations will be contingent upon determining whether an immediate or imminent hazard exists. The surveillance program for these items has been limited to date to an in-storage visual and air sampling inspection to detect actual leakers in the stockpile. There has been no laboratory type inspection programs to assess the condition and safety of the explosive, metal parts, and agent components. Therefore, the true condition of the stockpile and our projections for future deterioration remain unsubstantiated. The planned assessment is designed to provide a basis for determining the risks of continued storage of these items. Further, it will provide a scientific collection of data to support a timeframe for the ultimate disposal of the M55 rockets.

3. REFERENCES: See appendix H.

4. OBJECTIVES: The objectives of the special M55 GB/VX rocket assessment are to:

a. Determine whether the M55 GB/VX stockpile meets established safe storage requirements.

b. Identify degradation trends affecting continued safe storage.

c. Identify need for timely disposal.

d. Identify unsafe conditions which may be presently unknown in individual components, i.e., fuze, burster, propellant, igniter, warhead, shipping and firing tube, and associated metal parts.

e. Ensure logistical actions for continued safe storage of rockets when real or imminent hazards are identified.

f. Predict safe storage life.

5. TASK FORCE COMPOSITION: AMCCOM, DESCOM, USATHAMA, AMSAA, AMMRC, and FSA are performing the assessment. All participants agreed that the task force approach represents the most viable means of planning and accomplishing the assessment. Appendix F lists the task force organization.

6. CONDUCT OF ASSESSMENT: The overall risk assessment will be accomplished by AMSAA using mathematical models. This assessment will be based upon data elements derived through laboratory analysis to be performed by CRDC (Agent Analysis), AMMRC (Metal Analysis), and ARDC (Propellant and Explosive Component Analysis). Random samples from the stockpile will be selected for subsequent laboratory analysis. The sample collection will require equipment/facilities including the Drill and Transfer System (DATS), and Ammunition Peculiar Equipment (APE) such as the APE 1959 (Unit Agent Sampling for Chemical Munitions) and the APE 704C (Defuzing Machine). It will be necessary to transfer APE to sample all required storage locations. The collection, identification, control, and shipment of samples will be coordinated by the M55 Functional Task Group at Headquarters, AMCCOM, Rock Island, Illinois. The assessment will be conducted in strict compliance with appropriate state and federal directives governing safety and environmental restrictions.

7. DISPOSITION OF FINDINGS: The results of the laboratory analysis will be submitted to AMSAA for incorporation into the overall risk assessment. Each task group agency will be provided information copies of each laboratory report. The report of the overall risk assessment by AMSAA will be distributed as directed by the Task Force Chairman.

8. MILESTONES: The milestones for completion of the various tasks in order to accomplish the assessment will be furnished each task group agency.

9. FUNDING AND RESOURCES REQUIREMENTS: Funding requirements have been identified, and will be made available for conduct of the assessment. Disbursement of funds to agencies/installations associated with this assessment will be made by Headquarters, AMCCOM. Source of funds has been identified as P7M, Code 738017.

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APPENDIX A

M55 GB/VX ROCKET ASSESSMENT

METHODOLOGY/SAMPLING STRATEGY

APPENDIX A
Assessment: Methodology/Sampling Strategy

I. General: The purpose of the assessment is to characterize the M55 rocket stockpile to enable appropriate decisions to be derived as to timing of disposal activities. Degrees of deterioration of the rocket components and warhead will be identified, and to the extent feasible prediction regarding future trends in deterioration will be attempted.

II. Methodology:

A. A computer based statistical analysis will be accomplished by AMSAA utilizing the data and results of laboratory analysis to be conducted by the designated laboratory/quality assurance organizations. This assessment will be accomplished in two phases plus a special M28 propellant investigation. Phase 1 represents the amount of sampling, evaluation, and analysis which can be accomplished within a relatively short time period. Although, the sample sizes for Phase I is small, it will provide a sound basis for determining where future sampling operations should be concentrated. Conduct of Phase 2 is contingent upon early results and data analysis from Phase 1. It must be understood that the scope of Phase 2 is contingent upon additional data requirements for a complete assessment. The special propellant investigation consists of sampling M28 propellant lots across all storing locations.

B. AMSAA will provide necessary technical assistance to the participating depots regarding individual sample and sub-sample collection and identification.

C. A detailed listing of selected lot segments is contained in enclosures to this appendix.

III. Data Requirement: The above mentioned analysis by AMSAA will require the following input:

A. AMSMC-QA has provided a listing of all lot number and quantities of munitions and components, as well as a history of results of surveillance inspections to reflect the leakers experienced to date.

B. CRDC will provide analysis and characterization of agent samples generated in accordance with the sampling plan, as well as criteria for characterization to be determined by CRDC.

C. ARDC will provide analysis and characterization of propellant, burster, and fuze samples generated, as well as criteria for characterization to be determined by ARDC.

D. AMMRC will provide analysis and characterization of the metal parts generated through the sampling process, as well as criteria for characterization to be determined by AMMRC.

E. Coordination between AMSAA and the participating laboratories will be established to provide the format for data presentation to AMSAA.

IV. Reports:

A. Phase 1 - Interim report will be provided to task force chairman by AMSAA approximately 2 weeks after propellant stabilizer and agent test results are furnished. Final report will be furnished within 2 weeks of completion of Phase 1.

B. Phase 2 - Interim reports will be furnished weekly once sufficient data for analysis is received. Final report will be rendered within 6 weeks of receipt of all Phase 2 task data.

THOMAS COUSIN
US Army Systems Analysis Agency

Addendum to Appendix A

1. The following figures illustrate the M55 GB Rocket Lot Segment and M28 Propellant Lot Segment stockpile distribution, and the Phase I, Phase II, and Special Propellant Lot Sampling Plans.

2. The following tables list the selected M55 rocket lots, by lot number, sampled to support the Phase I and the Special Propellant Lot Sampling Plans. In addition, tables are included which detail the component lots that result form the Phase I rocket lot sampling.

a. The selected M55 rocket lot samples listed in tables IA-ID for the Phase I sampling and in Tables IVA-IVF for the special propellant lot sampling are subject to change as stockpile/sampling/disassembly conditions may dictate. In any event, where conditions indicate a requirement for a change in the selected rocket lot, no change will be made without the concurrence of the AMSAA representative. The Task Force Chairman will be advised by AMSAA of any changes in rocket lot selection.

b. A rocket lot/component lot sample/sub-sample identification code system will be used for continuous program lot/sample/sub-sample identification. The matrix for lot/sample/sub-sample identification is provided in tables V, VIA, and VIB.

(1) Table V provides identification numbers for lots selected in Phase I sampling. Additionally, these lots are listed in tables IA and ID for TEAD, UMDA, ANAD, and LBDA.

(2) Table VIA lists the identification numbers for M55 GB rocket lots selected for inclusion in special propellant sampling. These lots are also listed in Tables IVA through IVF for ANAD, JI, LBDA, PBA, TEAD, and UMDA.

(3) Table VIB contains identification numbes for M55 VX rocket lots selected for special propellant sampling. These lots are also listed in tables IVA through IVF for ANAD, JI, LBDA, PBA, TEAD, and UMDA.

c. Selection of the correct rocket identificaiton code must be accurately performed. In using these tables, four variables must be identified; type of sampling (Phase I or special propellant), agent fill (GB or VX), location of lot/lot segement (i.e., TEAD, UMDA, ANAD, LBDA, PBA, or JI), and lot number. Knowledge of these variables will allow proper sample identification. Two examples of this procedure are provided for clarification. The first example represents a lot selected for participation in Phase I sampling and the second represents a lot selected in Special Propellant Sampling.

(1) Example 1:

- Type of Sampling: Phase I

- Location: TEAD

- Agent Fill: GB

- Lot Number: 1033-52-1043

- In determining the correct identification code, selection of the correct table is based on the sampling strategy. Phase I necessitates use of table V for Phase I rocket lots. Lot number is listed on page A24 and indicates that this lot is located at ANAD and TEAD. To select the proper identification code one must find the "X" under TEAD and obtain the identification code for this line. In this case the code is 126T1 and 126T2.

(2) Example 2:

- Type of Sampling: Special Propellant

- Location: LBDA

- Agent Fill: VX

- Lot Number: 2011-32-2151

- In determining the correct identificaiton code, selection of the correct table is based on the sampling strategy. Special propellant necessitates use of tables VIA or VIB. The VX agent fill requires use of table VIB. The lot number are listed on page A36 and indicates the lot is located only at LBDA. The identification code is 426L1 and 426L2.

Figure 1A

M55 GB Rocket Lot Segment/Propellant Lot Segment Distribution

AGENT TYPE/ LOCATION	ANAD	JI	LBDA	PBA	TEAD	UMAD	TOTAL
PRO	22	45	34	126	74	70	371
PRO-RS	5	0	1	0	2	1	9
RO-RS	0	0	0	0	6	1	7
RD-RS	0	0	0	0	12	0	12
TOTAL	27	45	35	126	94	72	399

Figure 1B

M55 VX Rocket Lot Segment/Propellant Lot Segment Distribution

ANAD	JI	LBDA	PBA	TEAD	UMAD	TOTAL
44	28	25	44	68	25	234

Figure 1C

M28 Propellant Lot Distribution by Location

ANAD	JI	LBDA	PBA	TEAD	UMAD	TOTAL
25	21	19	52	37	31	185

Figure 1A (Cont)

NOTES

- o A total of 319 M55 GB rocket lots are in the stockpile.
- o A total of 185 M55 VX rocket lots are in the stockpile.
  - oo A rocket lot may be stored at more than one location, thus, there are more rocket lot segments than rocket lots.
- o A total of 113 M28 propellant lots are assembled to M55 rocket lots (GB and/or VX).
  - oo 85 in GB rocket lots.
  - oo 20 in VX rocket lots.
  - oo 8 common to both GB and VX rocket lots.
  - oo An M28 propellant lot may be assembled in more than one rocket lot. Thus, a propellant lot may be at more than one location.
  - oo A propellant lot may be assembled in both a GB and a VX rocket lot.

FIGURE 2

Phase I

GB Rocket Lot Sampling Plan (See Table 1A - 1D)

Agent Type/ Location	ANAD	JI	LBDA	PBA	TEAD	UMDA	TOTAL
PRO	3	0	3	0	6	10	22
PRO-RS	5	0	1	0	2	1	9
RO-RS	0	0	0	0	5	1	6
RD-RS	0	0	0	0	10	0	10
TOTAL	8	0	4	0	23	12	47

TWO ROCKETS SAMPLED PER LOT

42 ROCKET LOTS SAMPLED

COMPONENTS SAMPLED:

- M28 propellant
- M34 & M36 bursters
- M62 igniters
- M417 fuze
- M56 warhead
- GB agent
- M441 shipping and firing tube

Figure 3

Phase II - Rocket Lot Segment Sampling Plan

AGENT TYPE/ LOCATION	ANAD	JI	LBAD	PBA	TEAD	UMAD	TOTAL
PRO	7	12	6	15	17	14	71
PRO-RS	5	0	1	0	2	1	9
RO-RS	0	0	0	0	6	1	7
RD-S	0	0	0	0	12	0	12
TOTAL	12	12	7	15	37	16	99

SEVEN ROCKETS SAMPLED PER LOT

COMPONENT SAMPLES - IMPLEMENTATION CONTINGENT UPON THE RESULTS OF PHASE I, WORST CASE/BEST CASE RATIONALE

Figure 4

Special Propellant Sampling Plan

M28 Propellant Lot Segments (See Tables IVA-IVF)*

Sampling/ Location	ANAD	JICA	LBDA	PBA	TEAD	UMDA	TOTAL
Phase I	6 (8)	0	3 (4)	0	15 (23)	12	36 (47)
Special Prop							
GB	10	12	13	45	12	16	108
VX	9	9	3	7	10	3	41
Subtotal	19	21	16	52	22	19	149
TOTAL	25 (27)	21	19 (20)	52	37 (45)	31	185 (196)

Notes

*Quantity in parenthesis reflects the total number of propellant lots sampled. Phase I sampling will provide multiple sampling of identical propellant lots.

- 113 Propellant lots sampled - 100 percent across locations
- Two samples per lot consisting of 3 sub-samples each from 185 propellant lot (196 rocket lots)/location segments - 1,110 (1,176) sub-samples
  - GB 144 (155) lot/location segments - 864 (930) sub-samples
  - VX 41 lot/location segments - 246 sub-samples

Figure 4A

M61 Special Propellant Sampling Plan

M28 Propellant Lot Segments

Lot Number	Number of Samples	Location
RAD-2-102	10	Tooele
RAD-2-113	10	Tooele
RAD-2-132	10	Tooele
RAD-2-133	10	Tooele

TABLE IA

M55 GB ROCKET PHASE I SAMPLING

ANNISTON ARMY DEPOT (8 ROCKET LOTS)

GB Type	Ammo Lot No.	Agent Lot No.	M28 Propellant Lot #	M28 Propellant Dt/Mfg	M417 Fuze Lot No.	M34 Burster Lot No. (a)	M36 Burster Lot No. (a)	M62 Igniter Lot No.	M56 Warhead Lot No.	Remarks (b)
PRO	1033-46-1005	5651-D2	RAD-2-111	Oct 63	2011-42-13	LS-21-11	LS-14-15	2012-42-17	4013-44-122,123,124	Reclaimed from M34 Clusters
PRO	1033-52-1041	5651-91	RAD-2-119	Jan 64	2011-44-15	LS-21-14,15	LS-24-2	NY1794-31	4013-46-1104,1105,1106,1107	TEAD/Identified Leaker Lot
PRO	1033-53-1058	5651-97	RAD-2-122	May 64	2011-44-16	LS-5-14	LS-24-6	2012-43-111	4013-46-1141,1144,1145,1146,1147	UMAD/Identified Leaker Lot
						LS-21-16,17				
PRO-RS	1033-45-179	1034-44-1189	RAD-2-108	Aug 63	2011-42-13	LS-21-10	LS-14-13	2012-41-15	4012-43-1248,1249,1250,1251,1252,1253	LBAD/UMAD
PRO-RS	1033-45-181	1034-45-1188	RAD-2-109	Sep 63	2011-42-13	LS-21-10	LS-14-12,14	2012-41-15	4012-43-1255,1256,1257,1258	
PRO-RS	1033-45-182	1034-45-1235	RAD-2-109	Sep 63	2011-42-13	LS-21-10	LS-14-14	2012-41-15	4013-44-12	
PRO-RS	1033-45-183	1034-45-1235	RAD-2-109	Sep 63	2011-42-13	LS-21-10	LS-14-14	2012-42-16	4013-44-13	Leaker Lot
PRO-RS	1033-45-184	1034-45-1235	RAD-2-110	Sep 63	2011-42-13	LS-21-10	LS-14-14	2012-42-16	4013-44-13,14,15,16,17,18	
									4013-44-18,19,110,111	

(a) Comp B unless otherwise noted.
(b) Other storage locations.

TABLE IB

M55 GB ROCKET PHASE I SAMPLING

LEXINGTON - BLUEGRASS ARMY DEPOT (4 ROCKET LOTS)

GB Type	Ammo Lot No.	Agent Lot No.	M28 Propellant Lot # Dt/Mfg	M417 Fuze Lot No.	M34 Burster Lot No. (a)	M36 Burster Lot No. (a)	M62 Igniter Lot No.	M56 Warhead Lot No.	Remarks (b)
PRO	1033-44-166	5651-84	RAD-2-104 Jul 63	2011-42-11	LS-21-8	LS-14-10	NY1794-24	4012-42-1211,1212,1213A	TEAD/Johnston Island
PRO	1033-51-1022	5651-D2	RAD-2-114 Dec 63	2011-43-14	LS-21-12,13	LS-14-17	NY1794-16	4013-45-153,154,155,156,157A,158,159	Reclaimed from M34 Clusters
PRO	1033-51-1024	5651-162	RAD-2-114 Dec 63	2011-43-14	LS-21-13	LS-14-17,18	NY1794-27	4013-45-159,160A,161,162,163,164	Identified Leaker Lot
PRO-RS	1033-45-179	1033-44-1189	RAD-2-108 Aug 63	2011-42-13	LS-21-10	LS-14-13	2011-41-15	4012-43-1248,1249,1250,1251,1252,1253	ANAD/UMAD

(a) Comp B unless otherwise noted.
(b) Other storage locations.

TABLE IC
M55 GB ROCKET PHASE I SAMPLING
TOOELE ARMY DEPOT (23 ROCKET LOTS)

Agent Type	Ammo Lot No.	Agent Lot No.	M28 Propellant Lot #	M28 Propellant Dt/Mfg	M417 Fuze Lot No.	M34 Burster Lot No. (a)	M56 Burster Lot No. (a)	M62 Ignitor Lot No.	M56 Warhead Lot No.	Remarks (b)
PRO	1033-32-148	S651-35	RAD-2-72	Jun 62	NY1-835-1008	LS-5-7	LS-6-8	2011-31-11	4012-32-15A, 16A	TEAD/Johnston Island
PRO	1033-33-155	S651-142	RAD-2-74	Jul 62	NY1-835-1009	LS-5-10	LS-6-8	2011-31-13	4012-32-113, 116	TEAD/Johnston Island
PRO	1033-36-1108*	RM-4651-51	RAD-2-87	Dec 87	2011-35-15	LS-5-10	LS-14-2	2011-34-118	4012-35-196, 197, 198, 199, 1100	ANAD/Johnston Island
PRO	1033-43-148*	RM-6651-215	RAD-2-101	May 63	2011-36-18	LS-20-2(Tetrytol)	LS-14-7	2011-36-126	4012-41-1174, 1177	UMAD/Johnston Island
PRO	1033-44-163	S651-75	RAD-2-104	Jul 63	2011-42-11	LS-21-7,8	LS-14-10	NY-1794-23	4012-42-1204,1205A,1206A,1207,1216A	TEAD
PRO	1033-52-1043	RM-5651-91	RAD-2-119	Jan 64	2011-43-15	LS-21-14,15	LS-24-2	NY-1794-31	4013-46-1104, 1105, 1106, 1107	ANAD/Identified Leaker 1.
PRO-RS	1033-55-1076*	1034-55-1255	RAD-2-127	Sep 64	2011-45-17	LS-21-19	LS-24-7, 8	2012-43-114	2012-44-11A, 12A, 13A	Leaker lot
PRO-RS	1033-55-1077	1034-55-1255	RAD-2-128	Oct 64	2011-45-17	LS-21-20	LS-24-8	2012-43-114	2012-44-13A, 12A	
RO-RS	1033-46-1008	1034-46-1281	RAD-2-111	Oct 63	2011-42-13	LS-21-11	LS-14-15	2012-42-18	4013-44-126, 127A, 129, 130, 131	Leaker lot
RO-RS	1033-46-1009*	1034-46-1282	RAD-2-111	Oct 63	2011-42-13	LS-21-11	LS-14-15,16	2012-42-18	4013-44-131, 132, 133	Leaker lot
RO-RS	1033-46-1010	1034-46-1282	RAD-2-112	Oct 63	2011-42-13	LS-21-11	LS-14-16	2012-42-18	4013-44-131, 135	
RO-RS	1033-46-1012*	1034-46-1282	RAD-2-112	Oct 63	2011-43-14	LS-21-12	LS-14-16	2012-42-18	4013-44-138	
RO-RS	1033-52-1031	1034-51-1285	RAD-2-117	Dec 63	2011-44-15	LS-21-13,14	LS-24-1	NY1794-24	4013-45-178, 179	Leaker lot
RD-RS	1033-56-1082	1036-54-1002	RAD-2-129	Nov 64	2011-45-18	LS-21-21	LS-24-9	2012-44-115	2012-44-14A	
RD-RS	1033-56-1084	1036-54-1002	RAD-2-131	Dec 64	2011-45-18	LS-21-22	LS-24-9	2012-44-116	2012-44-15A	
									2012-44-16A	
RD-RS	1033-61-1086	1036-54-1001	RAD-2-131	Dec 64	2011-45-18	LS-21-22	LS-24-9	2012-44-117	2012-44-15A	
					2011-46-19				2012-45-16A	Leaker lot
RD-RS	1033-61-1087	1036-54-1003	RAD-2-131	Dec 64	2011-46-19	LS-21-22	LS-24-9	2012-44-117	2012-45-16A, 17A	Leaker lot
RD-RS	1033-61-1088	1036-54-1003	RAD-2-132	Dec 64	2011-41-19	LS-21-22, 23	LS-24-9	2012-44-117	2012-45-16A, 17A	
					2011-46-19			2012-46-18A		
RD-RS	1033-61-1089	1036-54-1003	RAD-2-132	Feb 65	2011-46-19	LS-21-23	LS-24-9	2012-44-118	2012-46-18A	
RD-RS	1033-62-1090	1036-54-1003	RAD-2-133	Mar 65	2011-46-19	LS-21-24	LS-24-10	2012-44-119	2012-45-17A, 18A-19A	
RD-RS	1033-62-1092	1036-54-1003	RAD-2-133	Mar 65	2011-46-19	LS-21-24	LS-24-10	2012-44-119	2012-46-19A	
RD-RS	1033-62-1093	1036-54-1003	RAD-2-133	Mar 65	2011-46-19	LS-21-24	LS-24-10	2012-44-118	2012-45-18A	
									2012-46-19A	
RD-RS	1033-62-1094	1036-54-1003	RAD-2-133	Mar 65	2011-46-19	LS-21-24	LS-24-10	2012-44-120	2012-46-19A	

(a) Comp B unless otherwise noted.
(b) Other Storage Locations

*Special CRDC Sampling

TABLE 1D

M55 GB ROCKET PHASE I SAMPLING

UMATILLA ARMY DEPOT (12 ROCKET LOTS)

GB Type	Ammo Lot No.	Agent Lot No.	M28 Propellant Lot #	M28 Propellant Dt/Mfg	M417 Fuze Lot No.	M34 Burster Lot No. (a)	M36 Burster Lot No. (a)	M62 Igniter Lot No.	M56 Warhead Lot No.	Remarks (b)
PRO	1033-31-129	5651-117	RAD-2-69	May 62	NY1835-1005	LS-5-6	LS-6-4	NY1794-6	4011-26-1136A,1137,1138A,1139A,1140B,1149A	PBA/TEAD
PRO	1033-32-149	5651-136	RAD-2-72	Jun 62	NY1835-1008	LS-5-4,7,13,14	LS-6-8	2011-31-11	4012-32-16A,17A,19,110	TEAD/Johnston Island
PRO	1033-35-1103*	4651-46	RAD-2-86	Dec 62	2011-34-14	LS-5-17	LS-14-2	2011-34-116	4012-34-177A,178,179A,180A,181,182,460,480	
PRO	1033-41-19	5651-101	RAD-2-91	Feb 63	2011-35-16	LS-21-1	LS-14-2	2011-35-120*	4012-35-486 4012-35-1128,1129,1132,4130	TEAD/Johnston Island
PRO	1033-41-115	5651-148	RAD-2-94	Feb 63	2011-35-16	LS-21-1	LS-14-4	2011-35-121	NY11468-37A	
PRO	1033-42-127	5651-160	RAD-2-96	Mar 63	2011-36-17	LS-21-4	LS-14-6	NY1794-22	NY11468-45A	
PRO	1033-42-136	6651-205	RAD-2-97	Apr63	2011-34-13	LS-20-3E1**	LS-13-10E1**	2011-36-124	4012-36-1144	
PRO	1033-42-140	5651-184	RAD-2-99	Apr 63	2011-34-13	LS-20-4 LS-20-5**	LS-13-9**	2011-36-125	4012-36-1151A,1152,1157A	
PRO	1033-43-148*	6651-215	RAD-2-101	May 63	2011-36-18	LS-20-2**	LS-14-7	2011-36-126	4012-41-1174,1177	TEAD/Johnston Island
PRO	1033-53-1058*	5651-97	RAD-2-122	May 64	2011-44-16	LS-5-14 LS-21-16,17	LS-24-6	2012-43-111	4013-46-1141,1144,1145,1146,1147	ANAD/Identified Leaker Lot
PRO-RS	1033-45-179*	1034-44-1189	RAD-2-108	Aug 63	2011-42-13	LS-21-10	LS-14-13	2012-41-15	4012-43-1248,1249,1250,1251,1252,1253	LBAD/ANAD
RO-RS	1033-53-1049*	1034-46-1282	RAD-2-120	Mar 64	2011-44-16	LS-21-16	LS-24-3	2012-43-19	4013-46-1118A,1119	Leaker Lot

(a) Comp B unless otherwise noted.
(b) Other storage locations.
* Special CRDC Sampling.
** Bursters composed of tetrytol

Table IIA - Component Lot Listing

M417 FUZE

Lot No's	Date of Mfg	Phase I*	Phase II
NYO-1450-1	Apr 61		
NYO-1450-2	Apr 61		
NYO-1450-3	Apr 61		
NYO-1450-4	May 61		
NYO-1450-5			
NYO-1450-6			
NYO-1450-8			
NYO-1450-10			
NYO-1450-11			
NYO-1450-12	Aug 61		
NYO-1450-13	Oct 61		
NYO-1450-14	Nov 61		
NYO-1450-17	Dec 61		
NY1-835-1	Oct 61		
NY1-835-2	Oct 61		
NY1-835-3	Oct 61		
NY1-835-4	Jun 62		
NY1-835-8	Dec 61		
NY1-835-1002	Apr 62		
NY1-835-1003	Apr 62		
NY1-835-1005	Apr, May 62	1	
NY1-835-1008	May, Aug 62	2	
NY1-835-1009	Jul 62	1	
NY1-835-1011	Sep 62		
NY1-835-1013	Oct 62		
NY1-835-1015	Nov 62		
NY1-835-1016	Dec 62		
211-33-12	Dec 62		
2011-34-13	Jan 63	2	
2011-34-14	Feb 63	1	
2011-35-15	Mar 63	1	
2011-35-16	Apr 63	2	
2011-36-17	May 63	1	
2011-36-18	Jun 63	2	
2011-42-11	Sep 63	2	
2011-42-12	Oct 63		
2011-42-13	Oct 63	11	
2011-43-14	Dec 63	3	
2011-44-15	Jan 64	3	
2011-44-16	Feb 64	3	
2011-45-17	Mar 64	2	
2011-45-18	Apr 64	3	
2011-46-19	May 64	9	

*Indicates number of rocket lots sampled.

Table IIB - Component Lot Listing

M34 BURSTER

Lot No's	Date of Mfg	Phase I*	Phase II
LS-5-1	Mar, Apr 61		
LS-5-2	Feb, Mar, Apr 61		
LS-5-3	Mar 61		
LS-5-4	Mar, Apr 61	1	
LS-5-5	Apr 61		
LS-5-6	May 61	1	
LS-5-7	May 61	2	
LS-5-8	Jun 61		
LS-5-9	Jun, Jul 61		
LS-5-10	Jul 61		
LS-5-11	Jul 61		
LS-5-12	Jul, Sep 61		
LS-5-13	Nov 61	1	
LS-5-14	Dec 61, Sep 63	4	
LS-5-15	Jan 62		
LS-5-16	Apr 62		
LS-5-17	May 62	1	
LS-5-18	Jun 62		
LS-5-19	May 62, Jul 62	1	
LS-19-1	Sep 62		
LS-19-2	Sep 62		
LS-19-3	Sep 62		
LS-20-2 **	Sep 62	2	
LS-20-3 **	Oct 62		
LS-20-3E1 **	Oct 62	1	
LS-20-4 **	Dec 62	1	
LS-20-5 **	Dec 62	1	
LS-21-1	Oct 62	2	
LS-21-2	Feb 63		
LS-21-3	Feb 63		
LS-21-4	Mar 63	1	
LS-21-5	Mar 63		
LS-21-6	Apr 63		
LS-21-7	May 63	1	
LS-21-8	May 63	1	
LS-21-9	Jul 63		
LS-21-10	Jul 63	7	
LS-21-11	Aug 63	4	
LS-21-12	Sep 63	2	
LS-21-13	Oct 63	3	
LS-21-14	Nov, Dec 63	3	
LS-21-15	Jan 64	1	
LS-21-16	Jan 64	3	
LS-21-17	Jan 64	2	
LS-21-18	Feb 64		

* Indicates number of rocket lots sampled.

** Burster composition is Tetrytol A-10

Lot No's	Date of Mfg	Phase I *	Phase II
LS-21-19	Mar 64	1	
LS-21-20	Mar 64	1	
LS-21-21	Apr 64	1	
LS-21-22	May 64	4	
LS-21-23	May 64	2	
LS-21-24	Jan 64	4	

*Indicates number of rocket lots sampled.

Table IIC - Component Lot Listing

M36 BURSTER

Lot No's	Date of Mfg	Phase I	Phase II
LS-6-1	Mar, Apr 61		
LS-6-2	Feb, Mar, Apr 61		
LS-6-3	Mar, Apr 61		
LS-6-4	Mar, Apr 61	1	
LS-6-5	Jun 61		
LS-6-7	Jun 61		
LS-6-8	Aug, Sep 61	3	
LS-6-9	Oct 61		
LS-11-1	Dec 61		
LS-11-2	Dec 61		
LS-11-3	Jan 62		
LS-13-9**	Oct 62	1	
LS-13-10**	Dec 62		
LS-13-10E1**	Dec 62	1	
LS-13-11**	Dec 62		
LS-13-12**	Dec 62		
LS-14-1	Apr 62		
LS-14-2	May 62	3	
LS-14-3	Jul 62		
LS-14-4	Oct 62	1	
LS-14-5	Dec 62		
LS-14-6	Dec 62	1	
LS-14-7	Jan, Feb 63	2	
LS-14-8	Feb 63		
LS-14-9	Mar 63		
LS-14-10	Apr 63	2	
LS-14-11	May 63		
LS-14-12	May 63	1	
LS-14-13	Jun 63	3	
LS-14-14	Jul 63	4	
LS-14-15	Oct 63	3	
LS-14-16	Nov 63	2	
LS-14-17	Dec 63	1	
LS-14-18	Dec 63	1	
LS-23-1	Dec 63		
LS-24-1	Jan, Feb 64	1	
LS-24-2	Feb 64	2	
LS-24-3	Mar 64	1	
LS-24-6	Mar 64	2	
LS-24-7	May 64	1	
LS-24-8	Jun 64	2	
LS-24-9	Jun 64	6	
LS-24-10	Aug 64	4	

*Indicates number of rocket lots sampled.

**Burster Composition is Tetrytol

Table IID - Component Lot Listing

M62 IGNITERS

Lot No's	Date of Mfg	Phase I*	Phase II
NYO-1426-5	Apr 61		
NYO-1426-6	Apr 61		
NY-1426-7	Dec 60		
NYO-1426-8	Apr 61		
NYO-1426-9	May 61		
NYO-1426-10	May 61		
NYO-1426-11	Apr 61		
NYO-1426-12	May 61		
NYO-1426-14	Nov 61		
NYO-1426-22	Jun 61		
NYO-1426-23	Jun 61		
NYO-1426-24	Jun 61		
NYO-1426-25	Feb 62		
NYO-1426-26	Feb 62		
NYO-1426-27	Feb 62		
NYO-1426-28	Mar 62		
NYO-1426-30	Mar 62		
NYO-1426-31	Mar 62		
NYO-1426-32	Apr 62		
NYO-1426-33	Apr 62		
NYO-1426-35	Apr 62		
NYO-1426-36	Apr 62		
NYO-1794-3	Apr 62		
NYO-1794-4	Apr 62		
NYO-1794-5	Apr 62		
NYO-1794-6	May 62	1	
NYO-1794-7	Jun 62		
NYO-1794-9	Aug 62		
NYO-1794-11	Aug 62		
NYO-1794-12	Aug 62		
NY-1794-15	Nov 62		
NY-1794-16	Apr 63	1	
NY-1794-20	Feb 62		
NY-1794-21	Dec 62		
NY-1794-22	Jan 63	1	
NY-1794-23	Jan 63	1	
NY-1794-24	Feb 63	2	
NY-1794-25	Mar 63		
NY-1794-26	Apr 63		
NY-1794-27	May 63	1	
NY-1794-28	Jun 63		
NY-1794-29	Jul 63		
NY-1794-30	Jul 63		
NY-1794-31	Jul 63	2	
2011-31-11	Jul 62	2	
2011-31-13	Aug 62	1	
2011-32-15	Sep 62		

*Indicates number of rocket lots sampled.

M62 IGNITERS (Cont'd)

Lot No's	Date of Mfg	Phase I*	Phase II
2011-32-17	Oct 62		
2011-32-18	Oct 62		
2011-32-19	Oct 62		
2011-32-110	Nov 62		
2011-33-111	Nov 62		
2011-33-112	Nov 62		
2011-33-113	Dec 62		
2011-33-114	Dec 62		
2011-34-115	Dec 62		
2011-34-116	Jan 63	1	
2011-34-117	Jan 63		
2011-34-118	Feb 63	1	
2011-35-119	Mar 63		
2011-35-120	Apr 63	1	
2011-35-121	Apr 63	1	
2011-36-122	May 63		
2011-36-124	May 63	1	
2011-36-125	Jun 63	1	
2011-36-126	Jun 63	2	
2012-41-11	Jul 63		
2012-41-12	Aug 63		
2012-41-13	Aug 63		
2012-41-14	Aug 63		
2012-41-15	Sep 63	5	
2012-42-16	Oct 63	2	
2012-42-17	Oct 63	1	
2012-42-18	Oct 63	4	
2012-43-19	Nov 63	1	
2012-43-111	Nov 63	2	
2012-43-112	Dec 63		
2012-43-113	Dec 63		
2012-44-114	Jan 64	2	
2012-44-115	Jan 64	1	
2012-44-116	Jan 64	1	
2012-44-117	Feb 64	3	
2012-44-118	Feb 64	2	
2012-44-119	Feb 64	2	
2012-44-120	Feb 64	1	

*Indicates number of rocket lots sampled.

Table IIE

M56 Warhead

-M56 Waehead Lot Number listing generated from the

the Phase I sampling may be developed from Tables IA -ID

Table III

Special M28 Propellant Sampling Master List

Lot No.	Date of Mfg.	Phase I						Phase II						Special Project: GB						Special Project: VX					
		TO	UN	PB	LB	AN	JI	TO	UN	PB	LB	AN	JI	TO	UN	PB	LB	AN	JI	TO	UN	PB	LB	AN	JI
RAD-2-1	Jul 60															X									
-2	Aug 60															X									
-5	Sep 60															X									
-7	Oct 60															X									
-8	Nov 60															X									
-9	Nov 60															X									
-10	Dec 60															X									
-11	Dec 60															X									
-12	Dec 60															X									
-13	Dec 60															X									
-14	Jun 61															X									
-15	Jun 61															X									
-16	Sep 61															X									
-17	Jan 61															X									
-18	Feb 61															X									
-19	Feb 61															X									
-20	Feb 61															X									
-21	Feb 61															X									
-22	Feb 61															X									
-23	Feb 61															X									
-24	61															X									
-25	Mar 61															X									
-26	61															X									
-29	Apr 61															X									
-30	Apr 61															X									
-31	Apr 61															X									
-32	Apr 61															X									
-33	Apr 61															X									
-34	May 61															X									
-35	61																					X			
-37	May 61															X									
-38	Jun 61															X									
-39	Jun 61															X									
-40	Jun 61															X									
-41	Jul 61															X									
-42	Aug 61															X									
-43	Aug 61															X									
-44	Sep 61																					X			
-45	Sep 61																					X			
-46	Sep 61																					X			
-47	Sep 61																					X			
-49	Oct 61																					X			
-50	Nov 61																			X		X			X
-51	Nov 61																			X					X
-52	Jan 62																			X					X
-54	Nov 61																			X					X
-55	Nov 61																			X					X
-56	Apr 62																			X					X
-57	Apr 62																			X				X	X
-58	Apr 62																							X	
-59	Jul 62															X								X	
-60	Mar 62															X									
-62	Mar 62															X									
-63	Apr 62																							X	
-64	Apr 62																							X	
-65	Apr 62															X									
-66	Apr 62													X	X				X						
-68	Apr 62													X	X				X						
-69	May/Apr 62		X											X		X			X						
-70	Apr 62																				X			X	X
-71	Apr 62																				X				X
-72	Jun 62		X											X					X						
-74	Jul/Apr 62													X					X		X		X		

Table III (cont'd)

Special M28 Propellant Sampling Master List

		Phase I						Phase II						Special Project: GB						Special Project: VX					
	Date of Mfg.	TO	UM	PB	LB	AN	JI	TO	UM	PB	LR	AN	JI	TO	UM	PB	LS	AN	JI	TO	UM	PB	LB	AN	JI
-75	Aug/Apr 62													X		X			X				X		
-76	Aug/Apr 62																X			X					
-77	Sep 62															X									
-78	Sep 62													X		X									
-79	Apr 62																			X			X	X	
-81	Oct/Apr 62													X	X	X	X	X							
-82	Apr 62																			X				X	
-83	Oct 62														X			X							
-84	Oct/Apr 62														X									X	
-85	Dec 62														X										
-86	Dec 62		X											X					X						
-87	Dec 62	X													X			X	X						
-88	Dec 62														X			X							
-89	Jan 63														X			X							
-90	Jan 63														X		X	X							
-91	Feb 63		X																						
-92	Feb 63														X										
-94	Apr 63		X														X								
-95	Mar 63														X		X								
-96	Mar 63		X														X								
-97	Apr 63		X														X								
-99	Apr 63		X																						
-100	Apr 63													X	X										
-101	May 63	X	X																X						
-102	May 63													X					X						
-103	Jun 63													X	X			X	X						
-104	Jul 63				X									X	X				X						
-105	Jul 63																X								
-107	Jul 63																X								
-108	Aug 83		X		X	X																			
-109	Sep 63					X																			
-110	Sep 63					X																			
-111	Oct 63	X				X																			
-112	?	X															X								
-113	Nov 63													X			X								
-114	Dec 63				X																				
-115	Dec 63																X								
-117	Dec 63	X															X								
-118	Jan 64													X											
-119	Jan 64	X				X																			
-120	Nov 63		X															X							
-122	May 64		X			X																			
-123	Jun 64														X			X							
-124	Jul 64																	X							
-127	Sep 64	X																							
-128	Oct 64	X																							
-129	Nov 64	X																							
-131	Dec 64	X																							
-132	Dec 64	X																							
-133	Mar 65	X																							

M28 Propellant Lot Sampling

ANNISTON (25 propellant lots)

Table IVA

Ammunition Lot No GB	Ammunition Lot No VX	Propellant Lot No	Selected In Phase 1*	Selected In Special Prop.	Priority**
1033-35-188		RAD-2-81		X	1
1033-35-194		-89		X	3
1033-35-197		-83		X	2
1033-36-1108		-87		X	3
1033-36-1110		-88		X	3
1033-41-12		-90		X	3
1033-44-158		-103		X	3
1033-45-179		-108	X		
1033-45-181		-109	X		
1033-45-184		-110	X		
1033-46-1005		-111	X		
1033-52-1043		-119	X		
1033-53-1050		-120		X	3
1033-53-1058		-122	X		
1033-54-1062		-123		X	3
1033-54-1070		-124		X	3
	2011-26-287	-57		X	2
	2011-26-288	-58		X	2
	2011-26-297	-59		X	2
	2011-26-299	-63		X	2
	2011-31-2114	-64		X	2
	2011-31-2117	-70		X	2
	2011-33-2173	-79		X	2
	2011-34-2179	-82		X	2
	2011-34-2193	-84		X	2

* Propellant Lot sampling accomplished in conjunction with Phase I sampling

** Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selections
2 - Lots RAD 2-1 thru 2-84
3 - Lots RAD 2-85 thru 2-133

M28 Propellant Lot Sampling

JOHNSTON ISLAND (21 Propellant Lots)

Table IVB

Ammunition Lot No. GB	Ammunition Lot No. VX	Propellant Lot No.	Selected In Phase 1	Selected In Special Prop.	Priority*
1033-31-132		RAD-2-68		X	2
1033-31-138		-69		X	2
1033-32-141		-66		X	2
1033-32-149		-72		X	2
1033-33-156		-74		X	1
1033-33-163		-75		X	2
1033-35-1103		-86		X	3
1033-36-1108		-87		X	3
1033-43-148		-101		X	3
1033-43-155		-102		X	3
1033-44-162		-103		X	3
1033-44-166		-104		X	3
	2011-24-246	RAD-2-50		X	2
	2011-24-251	-51		X	2
	2011-25-264	-54		X	2
	2011-26-285	-52		X	2
	2011-25-273	-55		X	2
	2011-26-280	-56		X	2
	2011-26-283	-57		X	2
	2011-31-2124	-70		X	2
	2011-32-2139	-71		X	2

*Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selections
2 - Lots RAD 2-1 thru 2-84
3 - Lots RAD 2-85 thru 2-133

M28 Propellant Lot Sampling

LEXINGTON-BLUE GRASS (19 Propellant Lots)

Table IV-C

Ammunition Lot No. GB	Ammunition Lot No. VX	Propellant Lot No.	Selected In Phase 1*	Selected In Special Prop.	Priority**
1033-41-14		RAD-2-90		X	3
1033-41-116		-94		X	1
1033-41-121		-95		X	3
1033-42-125		-96		X	1
1033-42-129		-97		X	1
1033-44-166		-104	X		
1033-44-170		-105		X	3
1033-45-175		-107		X	3
1033-45-179		-108	X		
1033-51-1014		-113		X	3
1033-51-1016		-76		X	2
1033-51-1017		-81		X	1
1033-51-1019		-112		X	1
1033-51-1024		-114	X		
1033-51-1026		-115		X	3
1033-52-1030		-117		X	1
	2011-32-2148	-74		X	1
	2011-32-2151	-75		X	2
	2011-33-2167	-79		X	2

* Propellant lot sampling accomplished in conjunction with Phase I sampling.

** Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selections
2 - Lots RAD-2-1 thru 2-84
3 - Lots RAD-2-85 thru 2-133

M28 Propellant Lot Sampling

PINE BLUFF (52 Propellant Lots)

Table IVD

Ammunition Lot No. GB	Ammunition Lot No. VX	Propellant Lot No.	Selected In Phase 1	Selected In Special Prop.	Priority*
RM-11002-11		RAD-2-12		X	1
RM-11002-12		-11		X	2
RM-11002-14		-13		X	2
RM-11002-17		-30		X	2
RM-21002-20		-10		X	2
RM-21002-22		-31		X	2
RM-21002-23		-8		X	1
RM-21002-24		-29		X	2
RM-21002-27		-32		X	2
1032-22-129		-33		X	2
1032-22-130		-21		X	2
1032-22-132		-37		X	2
1032-22-133		-38		X	2
1032-22-136		-34		X	2
1032-22-139		-1		X	2
1032-22-140		-2		X	2
1032-22-141		-5		X	2
1032-22-142		-7		X	2
1032-22-143		-9		X	2
1032-22-144		-14		X	2
1032-23-148		-15		X	2
1032-23-149		-16		X	2
1032-23-152		-17		X	2
1032-23-153		-18		X	2
1032-23-154		-19		X	2
1032-23-156		-20		X	2
1032-23-158		-22		X	2
1032-23-159		-23		X	2
1032-24-161		-25		X	2
1032-24-171		-39		X	2
1032-25-175-1 thru 5		-24		X	2
1032-25-175-1 thru 5		-26		X	2
1032-25-176		-40		X	2
1032-25-180		-41		X	2
1033-25-11		-42		X	2
1033-25-15		-43		X	2
1033-26-19		-59		X	2
1033-26-113		-60		X	2
1033-26-119		-62		X	2
1033-26-125		-65		X	2
1033-31-129		-69		X	2
1033-33-163		-75		X	2
1033-34-171		-77		X	2
1033-34-180		-78		X	2
1033-34-186		-81		X	1

M28 Propellant Lot Sampling

PINE BLUFF (CONT'D)

Table IV-D

Ammunition Lot No.		Propellant	Selected In		
GB	VX	Lot No.	Phase 1	Special Prop.	Priority*
	NY1767-M1	-35		X	2
	NY1767-M11	-44		X	2
	NY1767-M18	-45		X	2
	NY1767-M24	-46		X	2
	NY1767-M31	-47		X	2
	NY1767-M36	-49		X	2
	NY1767-M41	-50		X	2

*Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selections
2 - Lots RAD-2-1 thru 2-84

M28 Propellant Lot Sampling

TOOELE

Table IV-E (37 Propellant Lots)

Ammunition Lot No. GB	Ammunition Lot No. VX	Propellant Lot No.	Selected In Phase 1*	Selected In Special Prop.	Priority**
1033-31-129		RAD-2-69		X	2
1033-31-132		-68		X	2
1033-32-139		-66		X	2
1033-32-148		-72	X		2
1033-33-155		-74	X		2
1033-33-163		-75		X	2
1033-34-180		-78		X	2
1033-34-186		-81		X	1
1033-35-1103		-86		X	3
1033-36-1108		-87	X		
1033-43-148		-101	X		
1033-43-155		-102		X	3
1033-43-156		-100		X	3
1033-44-158		-103		X	3
1033-44-163		-104	X		3
1033-46-1008		-111	X		
1033-46-1012		-112	X		
1033-51-1014		-113		X	3
1033-52-1031		-117	X		
1033-52-1037		-118		X	3
1033-52-1043		-119	X		
1033-55-1076		-127	X		
1033-55-1077		-128	X		
1033-56-1082		-129	X		
1033-61-1087		-131	X		
1033-61-1088		-132	X		
1033-62-1092		-133	X		
	2011-24-246	RAD-2-50		X	2
	2011-24-251	-51		X	2
	2011-25-264	-54		X	2
	2011-25-273	-55		X	2
	2011-26-280	-56		X	2
	2011-26-283	-57		X	2
	2011-26-285	-52		X	2
	2011-33-2159	-76		X	2
	2011-33-2167	-79		X	2
	2011-34-2179	-82		X	2

*Propellant lot sampled in conjunction with Phase I sampling.
**Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selections
2 - Lots RAD-2-1 thru 2-84
3 - Lots RAD-2-85 thru 2-133

M28 Propellant Lot Sampling

UMATILLA (31 Propellant Lots)

Table IV-F

Ammunition Lot No. GB	Ammunition Lot No. VX	Propellant Lot No.	Selected In Phase 1*	Selected In Special Prop.	Priority**
1033-31-129		RAD-2-69	X		
1033-31-134		-68		X	2
1033-32-139		-66		X	2
1033-32-149		-72	X		
1033-34-186		-81		X	1
1033-35-195		-89		X	3
1033-35-199		-83		X	2
1033-35-1100		-84		X	2
1033-35-1102		-85		X	3
1033-35-1103		-86	X		
1033-36-1109		-87		X	3
1033-36-1113		-88		X	3
1033-41-12		-90		X	3
1033-41-19		-91	X		
1033-41-113		-92		X	3
1033-41-115		-94	X		
1033-41-119		-95		X	3
1033-42-127		-96	X		
1033-42-136		-97	X		
1033-42-140		-99	X		
1033-43-144		-100		X	3
1033-43-148		-101	X		
1033-43-158		-103		X	3
1033-44-167		-104		X	3
1033-45-179		-108	X		
1033-53-1049		-120	X		
1033-53-1058		-122	X		
1033-54-1065		-123		X	3
	2011-31-2123	-70		X	2
	2011-32-2139	-71		X	2
	2011-32-2147	-74		X	1

*Propellant Lot sampling accomplished in conjunction with Phase I sampling.
**Priority of sampling/evaluation/analysis, Special Propellant selections only.

1 - ARDC selection
2 - Lots RAD-2-1 thru 2-84
3 - Lots RAD-2-85 thru 2-133

PHASE I

TABLE V M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-31-129	RAD-2-69				X	X	⊗	101U1	
								101U2	
1033-32-149	-72		X				⊗	102U1	
								102U2	
1033-35-1103	-86		X			X	⊗	103U1	
								103U2	
1033-36-1108	-87	X	X			⊗		104T1	
								104T2	
1033-41-19	-91						⊗	105U1	
								105U2	
-41-115	-94						⊗	106U1	
								106U2	
1033-42-127	-96						⊗	107U1	
								107U2	
-42-136	-97						⊗	108U1	
								108U2	
-42-140	-99						⊗	109U1	
								109U2	
1033-43-148	-101		X			⊗	X	110T1	
								110T2	
-43-148	-101		X			X	⊗	110U1	
								110U2	
1033-44-166	-104		X	⊗		X		111L1	
								111L1	
1033-45-179	-108	⊗		X			X	112A1	
								112A2	
-45-179	-108	X		⊗			X	112L1	
								112L2	
-45-179	-108	X		X			⊗	112U1	
								112U2	
-45-181	-109	⊗						113A1	
								113A2	
-45-182	-109	⊗						114A1	
								114A2	
-45-183	-109	⊗						115A1	
				A-23				115A2	

PHASE I

TABLE V M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-45-184	RAD-2-110	⊗						116A1	
								116A2	
1033-46-1005	-111	⊗						117A1	
								117A2	
-46-1008	-111					⊗		118T1	
								118T2	
-46-1010	-112					⊗		120T1	
								120T2	
-46-1012	-112					⊗		121T1	
								121T2	
1033-51-1022	-114			⊗				122L1	
								122L2	
-51-1024	-114			⊗				123L1	
								123L2	
1033-52-1031	-117					⊗		124T1	
								124T2	
-52-1043	-119	⊗				X		126A1	
								126A2	
-52-1043	-119	X				⊗		126T1	
								126T2	
1033-53-1049	-120						⊗	127U1	
								127U2	
-53-1058	-122	⊗					X	128A1	
								128A2	
-53-1058	-122	X					⊗	128U1	
								128U2	
1033-55-1076	-127					⊗		129T1	
								129T2	
-55-1077	-128					⊗		130T1	
								130T2	
1033-56-1082	-129					⊗		131T1	
								131T2	
-56-1084	-131					⊗		132T1	
								132T2	
-61-1086	-131					⊗		135T1	
				A-24				135T2	

PHASE I

TABLE V M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-61-1087	RAD-2-131					X		136T1	
								136T2	
-61-1088	-132					X		137T1	
								137T2	
-61-1089	-132					X		138T1	
								138T2	
1033-62-1090	-133					X		139T1	
								139T2	
-62-1092	-133					X		140T1	
								140T2	
-62-1093	-133					X		141T1	
								141T2	
-62-1094	-133					X		142T1	
								142T2	
1033-32-148	-72					X		143T1	
								143T2	
1033-33-155	-74					X		144T1	
								144T2	
1033-44-163	-104					X		145T1	
								145T2	
1033-46-1009	-111					X		119T1	
								119T2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
RM 11002-11	RAD-2-12				⊗			301P1	
								301P2	
RM 11002-12	-2-11				⊗			302P1	
								302P2	
RM 11002-14	-2-13				⊗			303P1	
								303P2	
RM 11002-17	-2-30				⊗			304P1	
								304P2	
RM 21002-20	-2-10				⊗			305P1	
								305P2	
RM 21002-22	-2-31				⊗			306P1	
								306P2	
RM 21002-23	-2-8				⊗			307P1	
								307P2	
RM 21002-24	-2-29				⊗			308P1	
								308P2	
RM 21002-27	-2-32				⊗			309P1	
								309P2	
1032-22-129	-2-33				⊗			310P1	
								310P2	
-22-130	-2-21				⊗			311P1	
								311P2	
-22-132	-2-37				⊗			312P1	
								312P2	
-22-133	-2-38				⊗			313P1	
								313P2	
-22-136	-2-34				⊗			314P1	
								314P2	
-22-139	-2-1				⊗			315P1	
								315P2	
-22-140	-2-2				⊗			316P1	
								316P2	
-22-141	-2-5				⊗			317P1	
								317P2	
-22-142	-2-7				⊗			318P1	
				A-26				318P2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1032-22-143	RAD-2-9				⊗			319P1	
								319P2	
-22-144	-2-14				⊗			320P1	
								320P2	
1032-23-148	-2-15				⊗			321P1	
								321P2	
-23-149	-2-16				⊗			322P1	
								322P2	
-23-152	-2-17				⊗			323P1	
								323P2	
-23-153	-2-18				⊗			324P1	
								324P2	
-23-154	-2-19				⊗			325P1	
								325P2	
-23-156	-2-20				⊗			326P1	
								326P2	
-23-158	-2-22				⊗			327P1	
								327P2	
-23-159	-2-23				⊗			328P1	
								328P2	
1032-24-161	-2-25				⊗			329P1	
								329P2	
-24-171	-2-39				⊗			330P1	
								330P2	
1032-25-175-1 thru 5	*				⊗			331P1	
								331P2	
-25-175-1 thru 5	*				⊗			332P1	
								332P2	
-25-180	-2-41				⊗			333P1	
								333P2	
1033-25-11	-2-42				⊗			334P1	
								334P2	
-25-15	-2-43				⊗			335P1	
								335P2	
1033-26-19	-2-59				⊗			336P1	
				A-27				336P2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-26-113	RAD-2-60				X			337P1	
								337P2	
-26-119	-2-62				X			338P1	
								338P2	
-26-125	-2-65				X			339P1	
								339P2	
1033-31-129	-2-69				X			340P1	
								340P2	
-31-129	-2-69					X		340T1	
								340T2	
-31-129	-2-69						X		
-31-132	-2-68					X		341T1	
								341T2	
-31-132	-2-68		X					341J1	
								341J2	
-31-134	-2-68						X	342U1	
								342U2	
-31-138	-2-69		X					343J1	
								343J2	
1033-32-139	-2-66					X		344T1	
								344T2	
-32-139	-2-66						X	344U1	
								344U2	
-32-141	-2-66		X					345J1	
								345J2	
-32-149	-2-72		X					346J1	
								346J2	
-32-149	-2-72						X		
1033-33-156	-2-74		X					347J1	
								347J2	
-33-163	-2-75		X					348J1	
				A-28				348J2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-33-163	RAD-2-75					Ⓧ		348T1	
								348T2	
-33-163	-2-75				Ⓧ			348P1	
								348P2	
1033-34-171	-2-77				Ⓧ			349P1	
								349P2	
-34-180	-2-78				Ⓧ			350P1	
								350P2	
-34-180	-2-78					Ⓧ		350T1	
								350T2	
-34-186	-2-81				Ⓧ			351P1	
								351P2	
-34-186	-2-81					Ⓧ		351T1	
								351T2	
-34-186	-2-81						Ⓧ	351U1	
								351U2	
1033-35-188	-2-81	Ⓧ						352A1	
								352A2	
-35-194	-2-89	Ⓧ						353A1	
								353A2	
-35-195	-2-89						Ⓧ	354U1	
								354U2	
-35-197	-2-83	Ⓧ						355A1	
								355A2	
-35-199	-2-83						Ⓧ	356U1	
								356U2	
-35-1100	-2-84						Ⓧ	357U1	
								357U2	
-35-1102	-2-85						Ⓧ	358U1	
								358U2	
-35-1103	-2-86		Ⓧ				X	359J1	
								359J2	
-35-1103	-2-86					Ⓧ		359T1	
								359T2	
1033-35-1108	-2-87		Ⓧ			X		360J1	
				A-29				360J2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION LOCATION

ROCKET LOT NO	PROPELLANT LOT NO	AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-36-1108	RAD-2-87	⊗						360A1	
								360A2	
-36-1109	-2-87						⊗	361U1	
								361U2	
-36-1110	-2-88	⊗						362A1	
								362A2	
-36-1113	-2-88						⊗	363U1	
								363U2	
1033-41-12	-2-90	⊗						364A1	
								364A2	
-41-12	-2-90						⊗	364U1	
								364U2	
-41-14	-2-90			⊗				365L1	
								365L2	
-41-19	-2-91						X		
-41-113	-2-92						⊗	367U1	
								367U2	
-41-115	-2-94						X		
-41-116	-2-94			⊗				368L1	
								368L2	
-41-119	-2-95						⊗	369U1	
								369U2	
-41-121	-2-95			⊗				370L1	
								370L2	
1033-42-125	-2-96			⊗				371L1	
								371L2	
-42-127	-2-96						X		
-42-129	-2-97			⊗				372L1	
								372L2	
-42-136	-2-97						X		
-42-140	-2-99						X		
				A-30					

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-43-144	RAD-2-100						(X)	373U1	
								373U2	
-43-148	-2-101		(X)			X	X	374J1	
								374J2	
-43-155	-2-102		(X)					375J1	
								375J2	
-43-155	-2-102					(X)		375T1	
								375T2	
-43-156	-2-100					(X)		376T1	
								376T2	
1033-44-158	-2-103	(X)						377A1	
								377A2	
-44-158	-2-103					(X)		377T1	
								377T2	
-43-158	-2-103						(X)	377U1	
								377U2	
-44-162	-2-104		(X)					378J1	
								378J2	
-44-166	-2-104		(X)	X				379J1	
								379J2	
-44-167	-2-104						(X)	380U1	
								380U2	
-44-170	-2-105			(X)				381L1	
								381L2	
1033-45-175	-2-107			(X)				382L1	
								382L2	
-45-179	-2-108	X		X			X		
-45-181	-2-109	X							
-45-182	-2-109	X							
-45-183	-2-109	X							

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-45-184	RAD-2-110	X							
1033-46-1005	-2-111	X							
-46-1008	-2-111					X			
-46-1009	-2-111					X			
-46-1010	-2-112					X			
-46-1012	-2-112					X			
1033-51-1014	-2-113			Ⓧ				383L1	
								383L2	
-51-1014	-2-113					Ⓧ		383T1	
								383T2	
-51-1016	-2-76			Ⓧ				384L1	
								384L2	
-51-1017	-2-81			Ⓧ				385L1	
								385L2	
-51-1019	-2-112			Ⓧ				386L1	
								386L2	
-51-1022	-2-114			X					
-51-1024	-2-114			X					
-51-1026	-2-115			Ⓧ				387L1	
								387L2	
1033-52-1030	-2-117			Ⓧ				388L1	
								388L2	
-52-1031	-2-117					X			
-52-1037	-2-118					X		389T1	
								389T2	

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-52-1043	RAD-2-119	X				X			
1033-53-1049	-2-120						X		
-53-1050	-2-120	Ⓧ						390A1	
								390A2	
-53-1058	-2-122	X					X		
1033-54-1062	-2-123	Ⓧ						391A1	
								391A2	
-54-1065	-2-123						Ⓧ	392U1	
								392U2	
-54-1070	-2-124	Ⓧ						393A1	
								393A2	
1033-55-1076	-2-127					X			
-55-1077	-2-128					X			
1033-56-1082	-2-129					X			
-56-1084	-2-131					X			
1033-61-1086	-2-131					X			
-61-1087	-2-131					X			
-61-1088	-2-132					X			
-61-1089	-2-132					X			
1033-62-1090	-2-133					X			
-62-1092	-2-133					X			
-62-1093	-2-133					X			

PROPELLANT SAMPLING

TABLE VI A M55 GB ROCKET LOT CODING FOR SAMPLE IDENTIFICATION LOCATION

ROCKET LOT NO	PROPELLANT LOT NO	AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
1033-62-1094	RAD-2-133					X			
1032-25-176	-2-40				⊗			394P1	
								394P2	

PROPELLANT SAMPLING

TABLE VI B M55 ROCKET LOT CODING FOR SAMPLE IDENTIFICATION (VX)

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UN	ROCKET LOT SAMPLE CODE	COMMENTS
NY 1767-M1	RAD-2-35				⊗			401P1	
								401P2	
1767-M11	-2-44				⊗			402P1	
								402P2	
1767-M18	-2-45				⊗			403P1	
								403P2	
1767-M24	-2-46				⊗			404P1	
								404P2	
1767-M31	-2-47				⊗			405P1	
								405P2	
1767-M36	-2-49				⊗			406P1	
								406P2	
1767-M41	-2-50				⊗			407P1	
								407P2	
2011-24-246	-2-50					⊗		408T1	
								408T2	
-24-246	-2-50		⊗					408J1	
								408J2	
-24-251	-2-51		⊗					409J1	
								409J2	
-24-251	-2-51					⊗		409T1	
								409T2	
2011-25-264	-2-54					⊗		410T1	
								410T2	
-25-264	-2-54		⊗					410J1	
								410J2	
-25-273	-2-55		⊗					411J1	
								411J2	
-25-273	-2-55					⊗		411T1	
								411T2	
2011-26-280	-2-56		⊗					412J1	
								412J2	
-26-280	-2-56					⊗		412T1	
								412T2	
-26-283	-2-57		⊗					413J1	
				A-35				413J2	

PROPELLANT SAMPLING

TABLE VI B M55 ROCKET LOT CODING FOR SAMPLE IDENTIFICATION (VX)

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
2011-26-283	RAD-2-57					⊗		413T1	
								413T2	
-26-285	-2-52		⊗					414J1	
								414J2	
-26-285	-2-52					⊗		414T1	
								414T2	
-26-287	-2-57	⊗						415A1	
								415A2	
-26-288	-2-58	⊗						416A1	
								416A2	
-26-297	-2-59	⊗						417A1	
								417A2	
-26-299	-2-63	⊗						418A1	
								418A2	
2011-31-2114	-2-64	⊗						419A1	
								419A2	
-31-2117	-2-70	⊗						420A1	
								420A2	
-31-2123	-2-70						⊗	421U1	
								421U2	
-31-2124	-2-70		⊗					422J1	
								422J2	
2011-32-2139	-2-71		⊗					423J1	
								423J2	
-32-2139	-2-71						⊗	423U1	
								423U2	
-32-2147	-2-74						⊗	424U1	
								424U2	
-32-2148	-2-74			⊗				425L1	
								425L2	
-32-2151	-2-75			⊗				426L1	
								426L2	
2011-33-2159	-2-76					⊗		427T1	
								427T2	
-33-2167	-2-79			⊗				428L1	
								428L2	

PROPELLANT SAMPLING

TABLE VI B M55 ROCKET LOT CODING FOR SAMPLE IDENTIFICATION (VX)

ROCKET LOT NO	PROPELLANT LOT NO	LOCATION AN	JI	LB	PB	TE	UM	ROCKET LOT SAMPLE CODE	COMMENTS
2011-33-2167	RAD-2-79					X		428T1	
								428T2	
-33-2173	-2-79	X						429A1	
								429A2	
2011-34-2179	-2-82	X						430A1	
								430A2	
-34-2179	-2-82					X		430T1	
								430T2	
-34-2193	-2-84	X						431A1	
								431A2	

APPENDIX B

M55 GB/VX ROCKET ASSESSMENT

SAMPLE COLLECTION

APPENDIX B
Sample Collection

I. General: Sample collection will be conducted at six locations: Umatilla, Tooele, Lexington-Blue Grass, Anniston, Pine Bluff, and Johnston Island. Sample requirements (number of lots and quantity from each lot) have been developed by AMSAA (appendix A). Each location will remove the designated rockets from storage and transport them to the site selected for the sample collection. All storage and handling procedures will be conducted in accordance with approved safety procedures. Techniques, equipment, and processes established in this appendix will be used to collect samples. Each sample collected will be identified by, as a minimum, location, lot number, and rocket lot sample code assigned by AMSAA. Upon completion of sample collection all samples will be labeled, packaged, and transported to the designated agencies for final analysis, and all residues will be packaged, labeled, and stored in accordance with approved safety procedures. Special requirements and controls identified are amplified in this appendix. Sample collection may be conducted in two phases. Phase 1 will require taking two samples from 47 lot segments at four locations (ANAD, LBDA, UMDA, and TEAD) for agent, fuze, burster, shipping and firing tube, and metal parts, and 185 lot segments of propellant at six locations (ANAD, LBDA, UMDA, TEAD, PBA, and JI). Phase 2 is a follow on program which may or may not be pursued. A decision on the pursuit of Phase 2 will be made at the conclusion of Phase I and will be based on the analysis of the data collected to-date. DMWR# 9-1340-H520-L20 will apply to these operations. CONTINGENCY: Each location will x-ray the fuzes of all samples selected to detect any unusual conditions which may exist. X-raying will be accomplished by personnel from Pueblo Depot Activity utilizing their portable x-ray equipment. Although not required at this time, x-raying of fuzes may be required in the future, should lab analysis so dictate.

II. Items: Propellant and Igniter

A. Sample Requirements:

NOTE: LOI for removal of propellant grain and igniter is attached as enclosure 1 to this appendix. Packaging information is attached as enclosure 2.

1. Propellant: Samples from all locations will be cut at TEAD. These samples will be approximately 3 inches long and are to be selected from the forward end, center section, and aft end of each propellant grain and shipped to ARDC for analysis.

2. Igniter: The igniter will be removed from the propellant grain and the anti-resonance assembly, continuity tested, and prepared for shipment to ARDC for analysis.

B. Collection Procedures: Remove rear cap, leaving shorting plug attached to igniter lead. Remove rocket from shipping and firing tube. Place the rocket into the rocket restraining device and separate the warhead from the rocket motor utilizing an approved wrench. Rocket warheads will be placed in propelling charge cans and transferred to agent sampling operation or returned to storage for later disposition. Once the rocket motor has been separated from the warhead, remove the fin assembly. Remove internal motor components (propellant and igniter) and prepare for shipment as specified in enclosure 2 to this appendix. Transfer all propellant residue to demolition grounds.

C. Equipment: Equipment to be used for sampling is outlined in LOI, enclosure 1. The major items are as follow:

1. APE 1240.

2. Strap wrench/torque wrench.

3. APE 1959/1957 and Drill and Transfer System (DATS).

4. APE 7040A.

5. Reciprocating power saw at TEAD.

6. Rocket restraining device.

7. Vapor continment room (VCR) is required for motor/warhead separation.

D. Process: The process for collecting and preparing propellant and igniter samples is contained in a Letter of Instruction provided as enclosure 1, this appendix.

E. Special Requirements/Controls:

1. Insure shunt and grounding has been properly applied.

2. Insure all samples, residue, metal parts, etc., are properly tagged with all necessary information.

3. All propellant and igniter samples shipped to ARDC shall not contain agent nor reveal evidence of having been contaminated by agent.

4. 60 percent relative humidity required in vapor containment room.

F. Disposition:

1. Ship packaged propellant and igniter samples to ARDC, Dover, NJ 07801, ATTN: SMCAR-LCE-C, Dr. Richter.

2. Transfer rockets or rocket warheads to storage or drill and drain operation.

3. Transfer propellant residue to demolition grounds and excess igniters to storage.

III. Agent Sampling

A. Sample Requirements: Two agent samples, 10 ml each, are to be taken from each sample rocket. A total of 47 munition lots with two rockets per lot are to be selected for sampling in Phase 1 of this assessment. Sampling must be accomplished in such a manner as to maintain agent integrity from the time of sampling until analysis is completed. An additional sample size of 600 ml from 10 pre-designated lot segments will be required for accelerated surveillance studies.

B. Collection Procedures: Agent samples are to be removed from the rocket warheads after drilling the warhead. Upon completion of drilling, the warhead will be purged with dry nitrogen; the agent will be sampled with a syringe and placed in a nitrogen purged sample bottle. Each sample is to be marked and a log initiated showing location, rocket munition lot, agent lot number, and sample number. A separate record will be maintained at each location and furnished to AMSAA and CRDC. Each agent sample bottle will be removed to the installation laboratory facility/VCR where agent will be transferred and heat sealed in two separate ampoules with a minimum of 10 ml of agent in each. Samples are to be packed in accordance with DOT shipping regulations for shipment to designated laboratories for analysis.

1. DATS - Sample warheads will be provided to DATS after rocket motor and warhead disassembly. Warheads will be drilled using existing drilling procedures and two 10 ml agent samples obtained in accordance with operation #7-5, DATS SOP. An additional 600 ml sample will be taken from five lots identified in appendix A and packaged in the same way as the 10 ml samples. Once samples have been obtained, drain the remaining agent to a ton container or DOT bottle. Warhead will then be flushed at least twice with a solution of 10 percent isopropyl alcohol and 90 percent water to .2mg/m3 or below, temporarily plugged, and delivered to appropriate locations where fuze, bursters, and metal parts samples will be collected for appropriate analysis.

2. APE 1959/1957 - Sample warheads will be delivered to APE 1959/1957 after rocket motor and warhead disassembly. Remove warhead from container, position in APE 1959/1957, and draw agent samples IAW CRDC agent sampling procedures. Take two 10 ml agent samples from each warhead. An additional 600 ml sample will be taken from five lots identified in appendix A and packaged in the same manner as the two 10 ml samples. Once agent samples have been obtained, drain the remaining agent to a ton container or DOT bottle. Warhead will then be flushed at lease twice with a solution of 10 percent isopropyl alcohol and 90 percent water to .2mg/m3 or below, temporarily plugged, and delivered to appropriate locations where fuze, bursters, and metal parts samples will be collected for appropriate analysis.

C. Equipment:

1. APE 1959/1957 and rocket adapter kit.
2. Dry nitrogen bottles.
3. Sample syringe or vacutainer.
4. DATS system.
5. Agent sample bottles with ground-glass stoppers.
6. Parafilm tape.
7. M2A1 cans for agent sample transport.
8. Chemical protective clothing.

9. Packaging material for shipment of agent samples:

a. Glass ampoules.

b. Dry N_2.

c. O_2.

d. M-1 pigs with bolts and gaskets.

e. Vermiculite.

f. Ice.

g. Crates.

h. Mailing tubes.

i. LP gas.

j. Torch.

D. Process: The process for collecting and preparing agent samples is contained in a Letter of Instruction, provided as enclosure 1, this appendix.

E. Special Requirements/Controls: Ensure all samples, residue, metal parts, etc., are properly tagged with all necessary information.

F. Disposition

1. Samples: All samples collected will be taken to a central location (to be specified at each site location) for analysis or shipment to laboratory/CRDC for analysis.

2. Residue: Decontaminated residues will be stored in a central location until disposition instructions are received.

IV. M417 Fuze, M34/M36 Bursters, and Warhead Metal Parts

NOTE: Warhead must be drained prior to this operation.

A. Sample Requirement: Two each per component (fuze, burster, etc.) lot.

B. Collection Procedures: Mechanically unscrew the M417 point detonating fuze from the adapter and package for shipment to ARDC. This should preclude putting any torque on the burster column. This technique will not disturb the weld on the M56 warhead. However, if the adapter is unscrewed at this point by holding the warhead, the weld may appear to have failed. Remove the M36 burster and package for shipment to ARDC. Perform first helium leak test. Mechanically unscrew the adapter and remove the M34 burster. Hold

the adapter in proper storage container for AMMRC on-site representative's evaluation and package the M34 burster for shipment to ARDC. Perform second helium leak test. Helium leak tests may be performed on a limited number of warheads (as determined by AMMRC) which have exhibited indications of agent leakage. The leak test will be performed in accordance with procedures developed by CRDC. Warheads will be cut longitudinally from nose to base and held for inspection by an AMMRC representative.

NOTE: Decontaminate all metal parts that are selected for shipment to AMMRC to "clean conditional" status, utilizing oven vac equipment approved and used in previous stockpile test program, metallurgical (STPMTL) projects.

C. Equipment:

1. APE 7040A.

2. Helium leak test devices.

3. Cutting devices.

4. Oven-vac.

5. Vapor containment room.

D. Process: The process for collecting and preparing fuze, burster, and warhead metal parts is contained in a Letter of Instruction, provided as enclosure 1, this appendix.

E. Special Requirement/Controls:

1. All explosive samples and fuzes shipped to ARDC shall not contain nor reveal evidence of having been contaminated by agent. All samples are to be marked and identified in accordance with marking and identification instructions.

2. Metal parts for warhead samples will be flushed with 10 percent isopropyl alcohol and 90 percent water solution. All items must be clean conditional before shipment to AMMRC. All samples are to be marked and identified in accordance with marking and identification instructions.

F. Disposition:

1. M417 fuze to be shipped to ARDC, Picatinny Arsenal, Dover, NJ, ATTN: SMCAR-LCN, Mr. Robison.

2. M34 and M36 explosive bursters are to be shipped to ARDC, Picatinny Arsenal, Dover, NJ, ATTN: SMCAR-LCE, Dr. H. Matsuguma.

3. Warhead body/metal parts and adapter will be held in approved containers and will be provided to on-site AMMRC representative when requested for visual examination and selection of samples for shipment to AMMRC. AMCCOM in coordination with AMMRC, will provide disposition of residue metal parts.

V. M441 Shipping Container

A. Sample -- As required by AMSAA.

B. Collection Procedures -- Collect M441 containers from the rocket motor/warhead disassembly operation. Section container as directed by AMSAA and AMMRC. Pack for shipment.

C. Equipment: Common hand tools.

D. Process: See Collection Procedures.

E. Special Requirements: Container sections will be decontaminated as necessary to clean conditional prior to shipment to AMMRC.

F. Disposition: AMCCOM, in coordination with AMMRC, will provide disposition of residue metal parts.

A. KAY IVERSON
AMCCOM Product Assurance

RICHARD MORSE
AMCCOM Defense Ammunition Supply

RONALD E. STINES
DESCOM

LETTER OF INSTRUCTION

FOR

SPECIAL M55 ROCKET STOCKPILE ASSESSMENT

18 MARCH 1985

HQ, US ARMY ARMAMENT, MUNITIONS AND
CHEMICAL COMMAND, ROCK ISLAND, IL

Enclosure 1 to App B

Letter of Instruction

for

Special M55 Rocket Stockpile Assessment

Chapter I. Introduction

1-1. Scope: This Letter of Instruction (LOI) applies to all agencies, depots, and activities involved in the M55 Rocket Assessment Plan.

1-2. Purpose: The purpose of the LOI is to detail the procedures required to obtain M55 rocket components (fuze, burster, agent, metal parts, shipping/firing container, propellant, and igniter) for laboratory analysis and evaluation. This LOI is to be used as a guide for preparation of a local standing operating procedure (SOP).

1-3. General Requirements:

a. Two sample rockets will be selected from each of 47 lots for a total of 94 samples for Phase I of the assessment.

b. All operations are to be conducted by qualified personnel, such as surveillance or toxic material handlers who qualify in the Chemical Personnel Reliability (CPR) program.

c. Operations must be in strict compliance with all regulatory requirements, to include site plan, safety submission, and approved SOP.

d. Level A/B protective clothing will be worn at the site where operations are conducted since agent release is possible during disassembly operations.

e. Explosive components must exhibit no evidence of having been exposed to agent prior to shipment for analysis to organizations not having facilities to handle agent contaminated items.

1-4. Work Schedule: Work can begin once equipment is received installed, site safety submissions approved, SOPs approved, employees trained, and pre-operational survey has been successfully completed.

1-5. Tools and Equipment: Only tools and equipment specified in this LOI and depot SOPs are to be utilized for this operation.

1-6. Safety Requirements:

a. Each activity is responsible for complying with all applicable safety requirements of AMC/DARCOM regulations 385-100 and 385-102, this document, and local safety requirements.

b. General Safety Requirements: All M55 rocket special assessment operations will be performed in a manner which precludes chemical agent release and affords maximum safety to personnel and property, both private and public. Consequently, participating organizations will ensure that all plans/procedures in this plan for which they are responsible are sufficiently detailed to assure that they can be conducted in accordance with safety and health requirements contained herein and in references. As a minimum, the following safety measures will be observed:

(1) In all cases, a minimum number of people will be potentially exposed for a minimum period of time to a minimum amount of agent/explosive filled munitions consistent with safe and efficient operations.

(2) Emergency procedures will be followed as detailed in the CAIC plan for each individual organization involved. Any operation not covered by a current and approved Chemical Accident Incident Control (CAIC) plan will be included in a revision to the plan prior to that operation being conducted.

(3) SOPs will be prepared in advance for all M55 rocket special assessment operations that are not covered by applicable existing SOPs. Each SOP will provide, in detail, step-by-step procedures to include all necessary safety and health requirements. The SOPs will be approved by the facility commander or his designated representative (see AMC/DARCOMR 385-1 for detailed requirements for preparing SOPs.

(4) Before any agent operations may commence, all personnel directly involved in the operation will be thoroughly trained in the operational, safety, and health requirements of their respective duties (see AMC/DARCOMR 385-102, paragraph 7-2, for details on required chemical agent training).

(5) Training to cover the duties and actions required under the appropriate CAIC plan will be provided. The responsibility for providing this training rests with the commander exercising control over the operations involved.

(6) Pre-operational surveys will be conducted in accordance with AMC/DARCOMR 385-102 before the start of operation. Live rounds which are not designated as M55 rocket assessment samples may be used in prove out, drain, decontamination, and transfer procedures.

(7) As necessary site plans/safety submissions or amendments to existing site plans/safety submissions will be prepared and approved IAW AMC/DARCOMRs 385-100 and 385-102 prior to starting M55 rocket special assessment operations.

(8) All residue must be demilitarized and certified free of explosive and agent contamination prior to transfer to Property Disposal Office (PDO).

(9) Total containment is not required for disassembly of components, when the operations can be performed without using undue force. Total containment is required if undue force is used for disassembly of components.

c. Environmental Considerations: The M55 rocket stockpile assessment/sampling program must address the requirement for environmental documentation (i.e., Environmental Assessment (EA)). Each facility/ installation involved in the stockpile assessment has submitted environmental documentation to the M55 FTG. This documentation has been assembled into a comprehensive environmental assessment document representing all M55 operations.

1-7. Record Keeping and Reporting: A log will be maintained by each depot on each rocket that is sampled. An example of this log is contained at enclosure 1. The information to be maintained in the log will include:

a. The munition lot number.

b. Agent, propellant, igniter, fuzes, bursters, shipping/firing containers, and metal parts lot number as applicable.

c. Storage location and storage site.

d. Rocket lot sample code (sample numbers assigned by AMSAA).

A copy of the log is to be furnished to CRDC, ATTN: SMCCR-MU and AMSAA, ATTN: AMXSY-RW.

1-8. Facilities:

a. Facilities to perform these operations shall conform to the requirements contained in AMC/DARCOM-R 385-100 and AMC/DARCOM-R 385-102.

b. Operations will be conducted in areas designated for this purpose by the participating depot and in accordance with approved site plans.

c. Each facility or installations involved in the stockpile assessment plan has verified the adequacy of existing environmental documentation.

CHAPTER II

Sampling Operation for

Special M55 Rocket Stockpile Assessment

Section I: Operation No 1 - Transfer from Storage to Operating Line

2-1. Description of Operation:

a. Monitoring of storage facilities during handling operations shall be performed in accordance with paragraph 3-5 of AMC/DARCOM-R 385-102. The following will be the minimum safety requirements.

(1) Normal first entry monitoring procedures will be followed.

(2) The selected rockets will be vapor sampled using blue or white band tubes, in both the forward and aft end.

(a) If leaker is found, the defective rocket will be containerized IAW SB-742-1. The rocket may then be transported to the assigned leaker storage area.

(b) Non-leakers will be placed in a SPORT/PIG and transported to the processing area. A SPORT/PIG is used due to the possibility of generating a leaker during transport.

b. Identify the items by lot number. Lot integrity must be maintained at all times. A log will be maintained on all sample M55 rocket components.

c. CONTINGENCY: Although not required at this time, x-raying of fuzes may be required in the future, should lab analysis so dictate.

2-2. Special Safety Requirements:

a. Toxicological agent protective clothing must be in accordance with current guidance of DARCOM-R 385-102. Level A protective clothing must be worn in all operations where agent or agent contamination is present and during first entry monitoring of storage igloos.

b. Continuous low and high level agent monitoring will be accomplished by a combination of the M18A2 chemical agent detection kit, M8/M10 alarms.

c. A supply of decontamination agents and equipment for applying them must be immediately available for routine decontamination procedures.

d. Emergency eyewash equipment and emergency showers for personnel decontamination, must be available at storage and operational areas when operations are in progress.

e. CONTINGENCY: Use of x-ray equipment will be in accordance with approved SOPs.

2-3. Inspection Requirements: Surveillance personnel will assure performance of tasks outlined below:

a. Selection and transportation of samples.

(1) First entry monitoring.

(2) Random selection of M55 rocket samples.

(3) Tagging of samples.

(4) Utilization of approved material handling practices.

(5) Air testing of selected samples using blue or white band tubes.

(6) Leakers identified, logged and disposition completed in accordance with SB 742-1. Additional samples will be selected as replacements for leakers.

(7) Rockets loaded in transportation container and secured properly.

2-4. Equipment Requirements:

a. Approved transfer equipment (forklift, conveyor, etc.).

b. Decontamination equipment with decontamination materials and solutions.

c. Sealable containers (modified M1 ID set containers or SPORT).

d. M18A2 detector kit M8/M10 alarm.

e. Air Sampling Device APE 2053.

f. First aid kit, including atropine injectors.

g. Shower and change facilities with soap, towels, and dispoal cans.

h. TAP clothing as required.

i. Low level chemical agent detection equipment as required.

j. Modified M1 ID set container (standard) or SPORT.

k. X-ray equipment.

l. Not used.

m. Portable shower.

n. Strap cutters, face shield, safety glasses, leather palmed gloves, and banding equipment.

Section II: Operation No 2 - Warhead/Rocket Motor Separation

2-5. Remove End Caps and Rocket from Container:

NOTE

Rocket will be put back in the M441 container and containerized as a leaker if any agent tests are positive or if unknown exudate is present.

NOTE

Steps 2-5 and 2-6 will be accomplished in a negative air chamber.

NOTE

If rockets are in a SPORT container, the container will be vapor monitored prior to opening using white or blue band tube, M8 alarm for GB, or enzyme tickets for VX.

a. Unpack the rocket(s) from the SPORT/PIG.

b. Vapor sample the rocket on both the forward and aft ends using white or blue band tubes or M8 alarm for GB or enzyme tickets for VX.

c. Containerize rocket in SPORT/PIG IAW SB-742-1 if it is a confirmed leaker.

d. Position M441 container containing rocket in APE 2097.

e. Release bail and remove forward end cap and set to one side.

f. Inspect for visible signs of agent or unknown exudate. If signs of agent are present comply with paragraph 2-5c above. If unknown exudate is present, take a sample, if possible, and place in a sample bottle for shipment to analysis site. Identify exudate sample with appropriate markings applicable to rocket sample numbering system, transfer to storage, and nofity the M55 FTG at HQ, AMCCOM.

g. Release holding clip by unscrewing allen head screw on outside of shipping/firing container near fin assembly.

h. Release bail and remove aft end cap and assure igniter cable is shunted. Inspect for visible signs of agent or unknown exudate. If signs of agent are present, comply with paragraph 2-5c above. If not, apply ground wire to fin. Attach jumper cable from igniter shunt to fin to assure no difference in electrical potential between igniter and motor case. If unknown exudate is present, refer to procedures specified in paragraph 2-5f.

i. Remove shunted igniter cable from aft end cap and place screws to one side.

j. Slide rocket forward through forward end of shipping/firing container until fin assembly is visible. Inspect for visible signs of agent. If signs of agent or unknown exudate are present, comply with paragraph 2-5c above; if not, go to subparagraph k. If unknown exudate is present, refer to procedure specified in paragraph 2-5f. If rocket is pulled to far from the M441 container and the fins extend, immediately assure that ground cable to fin or rocket and jumper cable to the igniter shunt are still attached. Replace if necessary. A non-sparking, grounded tool must then be used to depress the fin locking pin to permit folding of the fins back into shipping configuration. Insert fins into mouth of M441 tube or clamp, tape fins.

k. Tape fin assembly together with a minimum of three wraps of nylon reinforced tape to prevent release when the rocket is fully removed from the shipping/firing container.

l. Not used.

m. Remove rocket fully from shipping/firing container. Attach transfer ground to rocket. Remove original ground from fin. Assure jumper cable remains connected.

n. Place rocket into the rocket restraining device.

o. Ground rocket to restraining device. Remove transfer ground.

p. Actuate clamp on the warhead and rocket motor.

q. Remove the holding clip from the igniter cable.

2-6. Method for Rocket Warhead/Motor Disassembly:

a. Position an approved wrench on rocket motor a minimum of 4 inches from warhead to rocket motor junction. Remove the rocket motor from the warhead. If warhead turns, position an approved wrench on warhead 1 inch from warhead and rocket motor junction and remove the rocket motor from the warhead. Apply no more than 215 foot pounds of torque. If torque limit is exceeded, attempt reassembly. If reassembly can not be accomplished, containerize round in extended modified ID set container.

b. If agent is detected during disassembly, reassemble to stop the leak, repack in M441 container, and overpack in modified M1 ID set container (PIG). If an unknown exudate is detected, stop disassembly, wrap joint with plastic, 4-6 mil polyethlene and tape with tape, vinyl, 2 inch or tape, polyethylene, 2 inch. Put rocket back into M441 container, install aft and cap, and tape forward end cap to hold it in place. Treat as a leaker and containerize in a PIG (extended if necessary).

c. Monitor the warhead to rocket motor junction immediately upon disassembly and if any agent is detected place the rocket motor back into the shipping and firing tube with spacers, mark the shipping and firing tube and return the rocket motor to storage. The warhead will be handled IAW paragraph 2-6d below.

d. Place Rocket Warhead in M10/M16 Prop Charge Can:

(1) Remove rocket warhead from holding fixture.

(2) Place cover over fuze for protection against agent contamination.

(3) Slide warhead gently into the M10/M16 propellant charge can. Pack in accordance with directions contained in enclosure 2 to appendix B of the assessment plan.

(4) Transfer rocket warhead in M10/M16 propellant charge can to security bay, storage, or disassembly operations.

e. The rocket motor will be placed in a clean M441 container and the shunt will be connected to the aft end cap; assemble cap to container. Insert filler material in forward end and assemble forward end cap. Remove sampling plugs and conduct bubbler test of rocket motor inside container IAW established procedures. If no contamination is detected or if contamination is detected below the Surgeon General's limit, the rocket motor can be removed to a conventional ammunition operational area for disassembly or palletized for shipment. If contamination above the Surgeon General's limit is detected, handle the rocket motor IAW paragraph 2-5c.

2-7. Special Safety Requirements:

a. A minimum of level B protective clothing must be worn for operations conducted in the VCR. Where agent or agent contamination is detected continued operation must be done in level A protective clothing in accordance with DARCOM-R 385-102.

b. Continuous low and high level agent monitoring will be accomplished by a combination of the M18A2 chemical agent detection kit, M8/M10 alarms, bubbler equipment, and Real Time Monitors (RTMs) if available.

c. A supply of decontamination agents and equipment for applying them must be immediately available for routine decontamination procedures.

d. Emergency eyewash equipment and emergency showers for personnel decontamination, must be available at storage and operational areas when operations are in progress.

e. No radio transmissions will be allowed within 300 feet of work site IAW 385-100.

f. Operators will wear legstats or conductive soled shoes, and will stand on conductive floors or mats during handling of rocket or rocket motor when out of the M441 shipping/firing tube.

g. Relative humidity within the VCR must be maintained at a minimum of 60 percent.

h. Continuous grounding of the rocket or rocket motor must be assured when out of the M441 container. A cross bond jumper cable from the igniter wire shunt to the fin assembly must also be used to assure the igniter wire circuit and motor case are at the same electrical potential.

i. Assure the exhaust duct shroud on the rocket restraining device (RRD) is fully extended and secured in place prior to disassembly.

j. In the highly unlikely event of rocket motor ignition during disassembly, operators must exit immediately.

k. Disassembly torque must not exceed 215 foot pounds.

2-8. Inspection Requirements: Surveillance personnel will assure performance of tasks outlined.

a. Marking of samples.

b. Utilization of approved material handling practices.

c. Air testing of selected samples using blue or white band tubes or M8 alarm for GB and enzyme tickets for VX.

d. Leakers identified, logged and disposition completed IAW SB 742-1. Additional samples will be selected as replacements for leakers.

e. Air testing of rockets after transportation to operation area.

f. Fin/nozzle assembly taped prior to completely removing rocket from shipping/firing tube.

g. Grounding of work surfaces and handling fixtures.

h. Rocket motor separated from warhead without undue force (215 foot pound maximum).

2-9. Equipment Requirements:

a. Approved transfer equipment (forklift, conveyor, etc.).

b. Decontamination equipment with decontamination materials and solutions.

c. Sealable containers (modified M1 ID set containers (standard and extended) or SPORT).

d. M18A2 detector kit.

e. Air Sampling Device APE 2053.

f. First aid kit, including Mark II kit.

g. Shower and change facilities with soap, towels, and dispoal cans.

h. TAP clothing as required.

i. Low and high level chemical agent detection equipment as required.

j. Vapor containment room (APE 5015 M1 or equivalent).

k. Pliers, nonsparking, grounded.

l. Not used.

m. Screwdriver, nonsparking, grounded.

n. Key set, socket head screw.

o. Legstats.

p. Strap Wrench 10".

q. APE 2097 Holding Device.

r. APE1953 conductive floor and shoe tester.

s. Rocket restraining device.

t. Torque wrench.

u. Humidifier (if local conditions dictate).

Section III - Removal of Propellant and Igniter

2-10. Method to Remove Propellant and Igniter Remotely: (For TEAD Only)

NOTES

WARNING: Rocket motor must be grounded at all times during this procedure.

Insure igniter cable is secured to fin assembly prior to insertion into APE 1240. Before actuating APE 1240, insure igniter cable is situated to allow fin to turn without igniter cable twisting or snagging.

a. Remove forward end cap and set aside. Remove aft end cap and attach ground wire to fin assembly. Insure jumper cable between fin assembly and igniter wire shunt is secure.

b. Disconnect igniter wire shunt from aft end cap.

c. Remove rocket motor from forward end of M441. Connect transfer ground and remove orginal ground. Transfer rocket motor to APE 1240. Insure ground is maintained.

d. Remove the nozzle cap with the wire protruding by using a nonsparking, grounded tool.

e. Cut off or bend over the shunt clip mounts so the igniter cable will thread through.

f. Operators will withdraw to safe area. Activate the APE 1240 remotely to remove fin assembly.

g. Operators return and thread the igniter cable with shunt through nozzle. Ensure ground is maintained.

h. Remove the sealing spacer and set aside. Remove rocket motor from APE 1240 and place it on a grounded table.

i. Spring pressure applied at the forward end of the rocket motor should push the propellant out of rocket motor section (enough to grasp). If not, remove rocket from APE 1240, transfer to table, and tip rocket slightly to assist in the removal of the propellant.

j. Remove propellant and all associated parts (igniter, anti-resonance assembly, and end washer). If the propellant grain cannot be removed by normal procedures and no foreign matter is visible in the rear threaded portion of the motor casing, reassemble the fin assembly by hand, if possible, pack in M441 and return to storage pending demilitarization. If the fin assembly cannot be reassembled, place a piece of plastic 4-6 mil, polyethylene over open end of motor casing and tap. Insure jumper cable from shunt to motor casing is intact. Pack in M441 and return to storage pending demilitarization.

k. Once propellant is removed, anti-resonance assembly, igniter, and end washer must be removed from propellant. Reassemble the fin assembly hand tight.

l. Not used.

m. Pack propellant for movement to cutting operation.

n. Identify propellant and igniters by rocket lot sample number code assigned by AMSAA, location, munition lot number, and igniter/propellant lot number. Lot integrity must be maintained.

o. Remove igniter and resonance rod assembly. Place in empty projectile body for transfer to continuity test operation. Perform continuity test on igniter. Igniters must be placed behind shield (IAW MIL Standard 398) during removal of shunt and continuity test. Perform continuity test and replace shunt on igniter cord. Record actual reading. Igniter specification resistance is between 0.375 and 1.250 ohms. If the resistance is below 0.375 ohms or above 1.250 ohms (but not open circuit) report the igniter(s) to AMCCOM M55 task force for disposition. Igniters with open circuits or readings less than 0.375 ohms are not to be shipped for analysis, but will be transported to storage pending disposition. However, all readings and data will be made a matter of record and provided to AMCCOM and the address listed in 2-10p below. Remove igniter from resonance rod assembly.

p. Pack, prepare igniters IAW AMCCOM instructions and ship to ARDC, ATTN: SMCAR-LCE, Dr. Matsuguma, Dover, NJ 07801.

r. Demilitarize anti-resonance assembly and miscellaneous parts and transfer to PDO after certifying 5X for explosives and having never been exposed to agent.

2-11. Section Propellant Grains at TEAD: (Remote location)

NOTE: Cut and discard the first 3-inches from the front and aft ends of the propellant grain.

a. Cut three 3-inch sections of propellant, one each from the middle, front, and aft section of the propellant grain utilizing a power saw.

b. Pack the three 3-inch sections in accordance with procedures furnished by AMCCOM maintaining lot integrity. Each section must be packed individually and marked, and the outer container must be marked with all munition lot number(s), propellant lot number(s), rocket lot sample code assigned by AMSAA, storage and site location, and section type (front, middle, aft).

c. Ship packaged sections to ARDC, ATTN: SMCAR-LCE, Dr. Richter, Dover, NJ, 07801, for analysis.

d. Pack propellant residue in approved storage containers and transfer to storage or demolition ground for disposal.

2-12. Special Safety Requirements:

a. No radio transmissions will be allowed within 300 feet of work site IAW 385-100.

b. Operators will wear legstats or conductive soled shoes, and will stand on conductive floors or mats during propellant/igniter removal and propellant cutting operation.

c. Operators will wear flame resistant explosive handlers coveralls, powder hat, and cotton underclothing. Operators handling the igniter assembly will wear an approved faceshield.

d. Operators must not stand directly in front of or behind the rocket motor during handling and disassembly operations.

e. Continous grounding of the rocket motor must be assured when out of the M441 container. Cross bonding between the igniter wire shunt to the motor case (or fin assembly when attached) must also be used to assure the igniter wire circuit and motor case are at the same electrical potential.

f. Fin disassembly is performed remotely.

2-13. Inspection Requirements: Surveillance personnel will assure performance of tasks outlined.

a. Selection and transportation of samples.

(1) Marking of samples.

(2) Utilization of approved material handling practices.

(3) Rockets loaded in transportation container and secured properly.

b. Propellant and Igniter sampling.

(1) Fin/nozzle assembly taped prior to completely removing rocket from shipping/firing tube.

(2) Grounding of work surfaces and handling fixtures.

(3) Propellant grain components disassociated and packaged in approved containers.

(4) Igniter samples continuity tested, tagged and outer container marked as surveillance samples IAW SB 742-1.

(5) Propellant grain samples selected, sectionalized, and tagged.

(6) Propellant grain samples packed and outer container marked as surveillance samples IAW SB742-1.

2-14. Equipment Requirements:

a. Approved transfer equipment (forklift, conveyor, etc.).

b. Pliers, nonsparking, grounded.

c. Pliers, cutting, nonsparking, grounded.

d. Screwdriver, nonsparking, grounded.

e. Key set, socket head screw.

f. Legstats.

g. Power saw.

h. Approve circuit continuity test equipment.

i. APE 1953, conductive floor and shoe tester.

j. APE 1240.

k. Approved, explosion proof vacuum.

Section IV - Warhead Drill and Drain (GB only)

NOTE

All agent sampling operations will be performed in a vapor containment chamber in accordance with DARCOM/AMC-R 385-102.

2-15. Description of Operation Agent Sampling Utilizing DATS:

a. Receive warhead in M10/M16 propellant charge can.

b. Ensure that AMCCOM approved fuze protector is in place, intact, and properly sealed to the warhead.

c. Place rocket in DATS glove box.

d. Drill 5/8" hole in warhead and purge with dry Nitrogen (N_2). Remove two each 10 ml or (600 ml accelerated aging) agent samples utilizing a sample syringe. Agent sample disposition is given in paragraph 2-14.

e. After sample has been removed, all the agent will be completely drained from warhead. A second 5/8" hole may be drilled if necessary to facilitate flushing of the warhead.

f. Warhead will be flushed repeatedly with a solution of 10 percent isopropyl alcohol and 90 percent water at a temperature of 80-90°F to remove residual agent and solids. Repeat as necessary to achieve a level of .2 mg/m^3 or lower.

g. Insert solid rubber plugs in holes in warheads. Rinse exterior of warhead with warm water (90°F) and check surface with M8 paper. Repeat until M8 paper test is negative. If necessary, sodium carbonate may be used to decontaminate warhead exterior, but must be rinsed off immediately and re-monitor.

h. Place the rocket in a plastic bag or other container so low level monitoring can be performed in accordance with DARCOM/AMC-R 385-102, to determine if the exterior of the item is decontaminated to the 3X level and safe for further handling. If item is not at or below the 3X level, it will be returned to the vapor containment area and further decontaminated.

i. Pack in accordance with packing instructions contained in enclosure 2 to appendix B for shipment to TEAD.

2-16. Agent Sampling Utilizing the APE 1959 - Agent Sampling Unit for Chemical Munitions.

a. Receive the warhead from holding area.

b. Insure that AMCCOM approved fuze protector is in place, intact, and properly secured to the warhead.

c. Slide warhead from propellant charge container.

d. Place warhead in the APE 1959 and position against stop with nose of warhead to rear of APE 1959 (away from operators).

e. Drill one 1/2" hole in warhead. Purge warhead with dry Nitrogen (N_2) and remove two each 10 ml agent samples utilizing a sampling syringe. Agent sample disposition is given in paragraph 2-19.

f. Transfer agent from warhead to ton container by vacuum.

g. Release clamp, slide warhead against other stop. Assure first hole drilled is straight up. Drill an additional 1/2" hole in the warhead on the same side of the warhead.

h. Fill warhead with 10 percent isopropyl alcohol/90 percent water flushing solution at 80°-90°F and circulate with pump until solids are in solution. Drain into sump filled with sodium carbonate solution. Repeat as necessary to achieve a level of .2 mg/m^3 or lower.

i. Insert rubber plugs in holes in warhead. Rinse exterior with warm water (90°F). Check the rocket surface with M8 paper. Repeat rinsing until M8 paper test is negative. If necessary, sodium carbonate may be used to decontaminate warhead exterior, but must be rinsed off immediately and re-monitored.

j. Agitate sodium carbonate/water-alcohol solution with air introduced into the liquid. Agitate for at least 15 minutes. Perform necessary test to assure neutralization.

k. Place the rocket in a plastic bag or other container so low level monitoring can be performed in accordance with DARCOM/AMC-R 385-102, to determine if the exterior of the item is decontaminated to the 3X level and safe for further handling. If item is not at or below the 3X level, it will be returned to the vapor containment area and further decontaminated.

l. Not used.

m. Pack in AMCCOM approved shipping container for transfer to component disassembly area (TEAD only). All other installations, pack the warhead for transportation in an AMCCOM approved shipping container for shipment to TEAD.

n. Transfer sodium carbonate/water-alcohol solution to brine holding tank.

2-17. Agent Sample Disposition: After the 10 ml samples have been removed from the warheads by syringe, they are to be placed in dry nitrogen (oil pumped) purged bottles and sent to the designated laboratory for analysis. Any samples requiring shipment to a laboratory for analysis are to be put into heat sealed vials. The Pine Bluff Arsenal quality assurance laboratory will analyze ANAD and LBDA agent samples. Dugway Proving Ground will analyze samples from UMDA and TEAD.

NOTE

Agent samples must be handled and protected as chemical surety material.

2-18. Agent Samples for Accelerated Aging Test:

a. Ten lot segments of rockets will be sampled. Lot numbers will be furnished by USAMSAA. One rocket from each lot will be drilled and 600 ml of material removed and packed for shipment to CRDC. Special care will be taken to preclude any possibility of cross contamination. Packaging will be in 40 ml alloquats.

b. Five each lots located at TEAD.

c. Five each lots located at UMAD.

d. Samples are to be recorded as designated in paragraph 2-1b.

e. Samples for accelerated aging tests are to be shipped to CRDC, SMCCR-SPS-M for analysis.

2-19. Agent Packaging Requirements:

a. When it is necessary to move agent samples off post, samples must be packaged as follows:

(1) Agent will be hermetically sealed in glass ampoules of not more than 40 ml nominal fill with 10 percent void space.

(2) Place ampoules in cardboard mailing tubes upon being leak tested and polariscoped. Cushion ampoules within the mailing tubes with cotton.

(3) Pack mailing tubes not more than 12 each per 5½ pint can and cushion tubes within the fiberboard container with vermiculite.

(4) Place cans into an M-1 steel ID set container with vermiculite. Install a Garlock 900 gasket on the gasket surface and bolt top on.

(5) Place cylinder in an overpack crate (3/4 inch thick plywood box).

b. Place all contaminated waste material in an approved contaminated waste container for disposal.

2-20. Special Safety Requirements:

a. Level B protective clothing will be worn by operators using the APE 1959. Where agent or agent contamination is detected outside of vapor containment, level A protective clothing will be required in accordance with DARCOM-R 385-102.

b. Continuous low and high level agent monitoring will be accomplished by a combination of the M18A2 chemical agent detection kit, M8/M10 alarms, bubbler equipment, and Real Time Monitors (RTMs) if available.

c. A supply of decontamination agents and equipment for applying them must be immediately available for routine decontamination procedures.

d. Emergency eyewash equipment and emergency showers for personnel decontamination, must be available at storage and operational areas when operations are in progress.

e. Once drilling and agent sampling operations are begun the agent filter systems will be run continuously until equipment has been decontaminated to 3X level upon completion of operations.

f. Vacuum will be maintained on the ton container during off duty hours.

g. Sodium carbonate decontaminant must not be allowed to enter the ton container, due to exothermic reaction with agent GB which could over pressure the ton container. Assure that agent transfer hose cannot drop into sump with decontaminant.

h. The valve end of the ton container must be under engineer controls for vapor containment during agent transfer operations.

i. The warhead flush solution must be drained into the glovebox sump where it will be agitated with sodium carbonate decontaminant for 15 minutes and tested for neutralization prior to draining the contents from the glovebox into appropriate containers.

2-21. Inspection Requirements: Surveillance personnel will assure performance of tasks outlined.

a. Selection and transportation of samples.

(1) First entry monitoring.

(2) Tagging/marking of samples.

(3) Utilization of approved material handling practices.

(4) Air testing of selected samples using blue or white band tubes.

(5) Leakers identified, logged and disposition completed IAW SB 742-1.

(6) Warheads loaded in transportation container and secured properly.

b. Agent Sampling:

(1) Proper set-up of agent sampling fixtures.

(2) Samples withdrawn in a manner which does not contaminate fuze, if possible.

(3) The 10 ml sample size/lot integrity maintained.

(4) Samples tagged properly and prepared for transfer to laboratory for analysis or for preparation for shipment.

(5) Samples heat sealed in glass ampoules.

c. Accelerated Aging Agent Sampling:

(1) Proper set-up of agent sampling fixtures.

(2) The 600 ml sample size/lot integrity maintained.

(3) Samples withdrawn after warhead has been purged with dry Nitrogen (N_2).

(4) Samples heat sealed in glass ampoules.

(5) Samples marked/tagged.

(6) Samples packaged for shipment and outer container marked as surveillance samples IAW SB 742-1.

2-22. Equipment Requirements:

a. Approved transfer equipment (forklift, conveyor, etc.).

b. Decontamination equipment with decontamination materials and solutions.

c. Sealable containers (M10/M16 prop charge containers).

d. M18A2 detector kit.

e. Air Sampling Device APE 2053 with M18A2 detection kit.

f. First aid kit, including mark II kit.

g. Shower and change facilities with soap, towels, and disposal cans.

h. TAP clothing as required.

i. Low and high level chemical agent detection equipment as required.

j. APE 1959/1957 and rocket adapter kit, with ancillary equipment.

k. Dry nitrogen bottles.

l. Not used.

m. Sample syringe or vacutainer.

n. DATS system.

o. Agent sample bottles with ground-glass stoppers.

p. Parafilm tape.

q. M2A1 cans.

r. Ton container.

s. Glass Ampules.

t. Dry nitrogen (N_2).

u. Oxygen (O_2).

v. M-1 pigs with bolts and gaskets.

w. Vermiculite.

x. Ice.

y. Crates.

z. Mailing tubes.

aa. LP gas.

bb. Torch.

Section V - Warhead Disassembly

2-23. Removal of Explosive Components from Warhead:

a. Receive warhead from agent sampling operation or from storage.

b. Fuze and burster removal will be conducted in a VCR. Fuze removal will be performed remotely. Transfer warhead to APE 7040A and remove fuze. Remove from APE 7040A and remove M36 burster. If M36 burster cannot be removed, cover the open burster tube with plastic 4-6 mil, polyethylene, and tape. Repackage in propellant charge container and transfer to storage. Treat as a chemical agent contaminated material pending demilitarization.

c. Visually inspect for agent and vapor test fuze cavity with blue or white band tubes. If agent contamination is confirmed or if an unknown exudate is discovered, consider the burster and fuze as contaminated. Take a sample of any exudate present and process in accordance with instructions in paragraph 2-5f. If a burster is found to be contaminated, the associated burster and fuze must be considered contaminated. Apply markings appropriate to rocket numbering system, transfer to storage, and notify the M55 FTG for disposition instructions.

d. If agent tests are negative in paragraph c above, pack fuze and M36 burster in separate plastic bags for later bubbler vapor test analysis. If bubbler test is positive for agent, treat the items as contaminated and process in accordance with instructions in paragraph c above for contaminated items.

e. Identify fuze and burster samples by lot number, rocket lot sample code assigned by AMSAA and rocket lot number.

2-24. Helium Leak Test and Warhead Parts Disposition: (For CRDC helium leak test personnel.)

a. Receive warhead (minus rocket motor, fuze, and M36 burster). Helium leak testing will be performed within the VCR.

b. Perform helium leak test on all warheads as follows:

(1) Seal nose adapter area.

(2) Attach vacuum pumps and helium leak detector.

(3) Bag warhead and fill with helium.

(4) Install protective shields.

(5) Conduct helium leak test.

(6) No leak indicated.

(a) End of test.

(b) Cut warhead per AMMRC instructions.

(7) Leak indicated.

(a) Isolate leaking section (nose weld, body, filter/ball seal).

(b) Attempt to pinpoint leak.

(c) Transfer warheads to fuze adapter removal operations (2-17).

2-25. Fuze Adapter & M34 Burster Removal:

a. Remove fuze adapter and M34 burster utilizing APE 7040A. Fuze adapter and burster removal will be conducted in a VCR. Fuze adapter removal will be performed remotely. Identify burster by lot number, rocket lot sample code assigned by AMSAA, and rocket lot number. Pack fuze adapter and burster in plastic bags for later bubbler test. If bubbler test is positive, treat the items as contaminated and process in accordance with instructions in paragraph 2-23c. If the M34 burster cannot be removed, process in accordance with paragraph 2-23b for M36 burster.

b. Perform helium leak test outlined in paragraph 2-24b. Helium leak test will be performed within the VCR.

c. Visually inspect for agent and vapor test burster well with blue or white band tubes. If agent contamination is confirmed or unknown exudate is discovered, consider the fuze, adapter, and bursters as contaminated. Process in accordance with instructions in paragraph 2-23c.

d. Cut metal parts per AMMRC instructions for visual inspection. AMMRC on-site representative will select samples for shipment to AMMRC for further evaluation and analysis. Cutting operations will be performed with engineering controls for vapor containment.

e. Decontaminate metal part samples to "CLEAN CONDITIONAL" status, utilizing oven/vac equipment similar to that used in previous Stockpile Test Program, Metallurgical (STPMTL) projects. Ship metal parts to AMMRC, ATTN: AMXMR-AMS/Mr. Levy, Watertown, MA.

f. M417 fuze to be shipped to ARDC, Picatinny Arsenal, ATTN: SMCAR-LCN/Mr. Robinson, Dover, NJ 07801. Since these cannot be processed in the oven/vac only those items declared as "never having been exposed to agent" can be shipped to ARDC.

g. M34 and M36 burster explosive to be shipped to ARDC, Picatinny Arsenal, Dover, NJ, ATTN: SMCAR-LCE, Dr. H. Matsuguma. Since these cannot be processed in the oven/vac, only those items declared as "never having been exposed to agent" can be shipped to ARDC.

2-26. Special Safety Requirements:

a. Level B protective clothing must be worn for operations conducted in the VCR. Where agent or agent contamination is detected continued operation must be done in level A protective clothing IAW DARCOM-R 385-102.

b. Continuous low and high level agent monitoring will be accomplished by a combination of the M18A2 chemical agent detection kit, M8/M10 alarms, bubbler equipment, and Real Time Monitors (RTMs) if available.

c. A supply of decontamination agents and equipment for applying them must be immediately available for routine decontamination procedures.

d. Emergency eyewash equipment and emergency showers for personnel decontamination, must be available at storage and operational areas when operations are in progress.

e. Operators will wear legstats or conductive soled shoes, and will stand on conductive floors or mats during removal and handling of bursters.

f. Fuze and fuze adapter removal will be performed remotely.

g. Metal parts samples from the warhead shipped to organizations without facilities for handling agent contaminated items must be decontaminated to a "Clean Condition" level.

h. Explosive samples (to include the fuze) that have seen agent contamination, even following decontamination to 3X level, can be shipped only to organizations having facilities for handling agent contaminted items. Therefore, explosive samples and fuzes must receive certification as never having been exposed to agent (clean) before they can be shipped to ARDC for anlaysis.

2-27. Inspection Requirements:

a. Air testing of all fuze cavities and burster wells using blue or white band tubes.

b. Contaminated or suspect items identified, logged, and transferred to storage.

c. Sample properly tagged and prepared for transfer to laboratory for analysis.

2-28. Equipment Requirements:

a. Air sampling device APE 2053 with M18A2 detector kits.

b. TAP clothing as required.

c. Low and high level chemical agent detection equipment as required.

d. APE 7040A.

e. Decontamination equipment with decontaminating materials and solutions.

f. First aid kit with Mark II kit.

g. Shower and change facilities with soap, towels, and disposal cans.

h. Sealable containers.

i. Helium leak test equipment.

Section VI - Sectionalize Shipping and Firing Tube, M441.

2-29. M441 Container Disposition:

a. Sample Requirement: Sample size will be between 20-35 containers.

b. Collect M441 containers from M60 or M61 rockets.

c. Sectionalize containers as directed by AMMRC/AMSAA.

d. Sample sections of M441 containers will be marked with rocket lot sample code, rocket lot number, location and site, and prepared for shipment.

2-30. Special Safety Requirements: Assure interior of M441 container is free of explosive exudates.

2-31. Inspection Requirements: Surveillance personnel will assure performance of tasks outlined below:

a. Sample containers are properly selected.

b. M441 container sectionalized in accordance with AMMRC instructions.

c. Samples marked in accordance with marking instructions.

d. Samples packaged in accordance with packaging instructions contained in appendix B, enclosure 2 and outer packages marked in accordance with marking instructions.

2-32. Equipment Requirements:

a. Power saw.

b. Hand tools as required.

2-33. Operational Checklist Requirement: The following checks must be incorporated into a checklist for the Motor/Warhead Separation Operation:

a. Pre-operational check points;

(1) Calibration of torque wrench.

(2) Ground cables intact for equipment and tools.

(3) Leg stats for use with tap clothing must be worn and tested prior to each day's operation.

(4) Conductive flooring or floor mats are clean and have been tested.

(5) Visual inspection rocket restraining device.

(6) Humidification to 60 percent relative humidity.

(7) Assure appropriate toxicological agent protective (TAP) clothing is available and serviceable.

(8) Assure ventilation system is operating properly and an audible alarm or visual means of alerting operators to low air flow (high pressure) is available.

(9) Assure necessary first aid and decontaminating equipment is in place.

(10) Assure monitoring equipment is in place and functioning properly.

(11) Remove all extraneous materials and equipment.

b. Operational check points:

(1) Visual inspection of rocket exterior for indications of unknown exudate, agent, or unusual conditions when nose cap is first removed, when rocket is removed from M441, when motor/warhead joint is first loosened, and after disassembly. Recontainerize if agent or unknown exudate is discovered; do not disassemble further.

(2) In addition to visual inspection and area monitoring, vapor monitoring for agent contamination will be performed on the interior of the M441 after transport, prior to removing end caps, and during actual disassembly. For agent VX additional emphasis must be placed on visual inspection with use of M8 paper for liquid test and the use of enzyme tickets for a high level vapor test. If agent is confirmed, containerize as a leaker.

(3) Application of ground wire to the rocket and attaching cross bond jumper from igniter wire shunt to the fin asembly.

(4) Assure continuous grounding of rocket or rocket motor throughout.

(5) Assure adapter is seated in nose receptacle and exhaust shroud is fully extended and locked in place.

(6) Actual use of torque wrench to assure disassembly torque limit (215 ft-lbs) is not exceeded.

c. Post Operational check points:

(1) Bubbler test of components (rocket motor) to assure no low level contamination.

(2) Monitoring of VCR to assure no residual contamination if they have processed leaking munitions during the operation.

(3) Assure disassembled components have been properly packaged and marked.

LETTER OF INSTRUCTION
FOR
SPECIAL M55 ROCKET (M520) STOCKPILE ASSESSMENT

APPROVALS:

COL WAYNE C. BOYD
AMCCOM

RONALD E. STINES
DESCOM

M55 ROCKET SPECIAL ASSESSMENT

DEPOT LOG

LOCATION:

MUNITION LOT NO:

STORAGE SITE: DATE SEPARATED:

COMPONENT	LOT NUMBER	SAMPLE CODE NUMBER	DATE SAMPLED	DATE SHIPPED	REMARKS

Enclosure 1 to LOI

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
SMCAR-ESK	Request for Packaging M55 Rocket Explosive Compnents

TO AMSMC-DS
ATTN: Col. Boyd

FROM SMCAR-ES

DATE 23 OCT 1984

CMT 1
Mr. Holcombe/pdt/4564

Packaging for the subject items are furnished as follows:

a. M417 Fuze, PD (encl 1).

b. M28 Grain Propellant Sample (encl 2).

c. M34 Burster (encl 3).

d. M36 Burster (encl 4).

e. M62 Igniter with Squib M2 (encl 5).

f. M55 Rocket Motor (encl 6).

g. M55 Rocket Projectile (drained) (encl 7).

h. Strut Assembly (encl 8).

8 Encl
as

for L. J. ARTIOLI
Director, Engineering Support Directorate

Enclosure 2 to App B

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

Fuze, PD M417

Pack fuzes in accordance with drawing 8882443 and 8882444 and mark in accordance with MIL-STD-129, paragraph 5.6 and drawing 8796522.

Place 12 fuzes in top and base supports (drawing 8882442* and 8882441 respectively). Add top filler(s) (fiberboard, chipboard, or polystyrene) as required to obtain a tight pack and close can. Mark M2A1 metal can with nomenclature, NSN or PN, and quantity. Attach a tag with all lot data. Place two M2A1 metal boxes in the wirebound box and mark with a DOT proper shipping name of "Detonating Fuzes, Class A Explosives - Handle Carefully - Do Not Store or Load With Any High Explosives," and a nomenclature of "24-Fuze, Rocket, PD, M417," gross weight and attach tag with lot data.

*Note - If top support for fuze is not available use one-inch thick polystyrene as required to fill upper void on metal box, M2A1 and add fiber top pads to obtain a tight fit when lid of box is closed.

Encl 1

M28 Grain Propellant (3-inch Samples)

Place one sample (3-inch long by 4.21-inch diameter) in a barrier bag, MIL-B-81705, with a card or label showing the lot data; tape bag closed. Place six bags on a corrugated fiberboard sheet (PPP-C-291) (corrugation down) 31.25 inches by length as required. Roll bags in the fiberboard sheet to an approximate diameter of 5.25 inches and tape. Place a 1/2-inch fiberboard pad in the end of an M14 series prop charge container* and insert the fiberboard roll with propellant. Add fiberboard to the roll as required to obtain a tight fit. Add a fiberboard pad, thickness as required to contact container lid when closed, and seal container. General marking will be in accordance with MIL-STD-129, paragraph 5.6.

*Mark the container with a DOT marking of "Propellant Explosives Class A," quantity, and nomenclature, e.g., "6-Propellant Grain, M28," NSN or part number, gross weight of container with contents, and attach tag with lot data. Palletize containers (M14 series) in accordance with AMC drawing 19-48-4042A/3.

*See drawings 8880528 and 7548187.

Encl 2

Burster M34

Use drawings 8799208 and 8799209 as package example. Place each burster in a barrier bag (MIL-B-81705). Place a card or label with lot information in/on bag with sample, close bag and tape shut.

Place a fiberboard pad (PPP-F-320) in the bottom of a fiberboard box (PPP-B-636 WR V3S) approximate ID 18.25 inches by 7.75 inches by 3.5 inches high. Place 30 bursters in two layers of 15 bursters each in the box with a fiberboard separator between the layers using a 5 by 3 by 2 pattern. Add fiberboard fillers and top pads as required to obtain a tight fit. Close and seal box. Blunt corners of fiberboard box and place box in a MIL-B-131 barrier bag, exhaust all air, and heat seal the bag. Place a fiberboard bottom pad and side fillers (solid) PPP-B-320 with two bags (60 Bursters) in a wood box (MIL-B-2427). Add top pad(s) as required to obtain a tight pack and close and seal box in accordance with the box specification. Approximate box size, 20 inches by 9.75 inches by 10.5 inches high (inside dimension).

General marking will be in accordance with MIL-STD-129, paragraph 5.6 and drawing 8796522.

Mark fiber box and barrier bags with label or stencil showing PN or NSN, quantity-nomenclature, "30-Bursters, M34," gross weight, and lot data.

Mark exterior box with a DOT proper shipping name of "Bursters (Explosive)- Handle Carefully" on top of box. Nomenclature -"60 - Bursters, M34".

PN of NSN_____

Gross Weight on Box_____

Tag with lot information of contents.

Encl3

Burster M36

Using drawing 8799208 and 8799209 as packaging examples. Place each burster in a barrier bag (MIL-B-81705) with a card or label showing lot number. Close bag and tape shut. Place a fiberboard pad (MIL-F-320) in the bottom of a fiberboard box (PPP-B-636 WR V3S) approximate ID 22.5 inches by 7.75 inches by 3.5 inches high and place two layers of five bursters each (10 bursters) in the box with a fiberboard separator between layers using a 1 by 5 by 2 high pattern. Add fillers and top pads as required to obtain a tight fit. Blunt corners of box and place box in a barrier bag (MIL-B-131), exhaust air and heat seal bag. Place a bottom fiberboard pad and two bags (20 Bursters) in a wooden box (MIL-B-2427), approximate box size 23.50 inches by 8.5 inches by 7.5 inches (inside dimensions). (Approximate box O.D. 26.5 inches by 10.0 inches by 9.75 inches). Add fiberboard (solid) side fillers and top pad(s) to obtain a tight pack. Close and seal box in accordance with the box specification.

General marking will be in accordance with MIL-STD-129, paragraph 5.6 and drawing 8796522. Mark fiberboard box and barrier bag with label or stencil showing NSN or Part Number, quantity-nomenclature "10-Burster, M36," gross weight, and all lot data. Mark exterior box with a DOT proper shipping name of "Bursters (Explosive)- Handle Carefully," a nomenclature "20-Bursters, M36," Part Number or NSN, gross weight and lot data attached by tag.

Igniter M62 With Squib M2

Wrap one igniter with squib and wire bundle in a paper cushion wrap (PPP-C-843) and place in a barrier bag (MIL-B-81705) with a card or label showing lot number of item. Close bag and tape shut.

Place a bottom fiber pad (solid) PPP-F-320 and four layers of eight bags each (32 igniters) in a 4 by 2 by 4 pattern in a fiberboard box PPP-B-636, Style RSC 125, B Flute, Type CF, Class Domestic, Variety SW (approx. ID 11 inches by 5.5 inches by 6.5 inches). Add a fiberboard separator between each layer of bagged igniters and side fillers and top pads to obtain a tight pack. Close and top seal box. Place box in a barrier bag approximately 19 inches by 14 inches, MIL-B-131, exhaust all air and heat seal bag. Place a bottom filler pad PPP-F-320 and two bags side by side in a fiber box PPP-B-636 WR V3S SFF (approx. ID 11.25 inches by 11.25 inches by 6.75 inches). Add top pads and side fillers as required to obtain a tight pack and close and seal box in accordance with box specification overpack in a PPP-B-601 Plywood Cleated Box. Mark inner box and bag with waterproof label in accordance with MIL-STD-129 as follows:

"32-Igniters Rocket Motor M62 with Squib M2"

PN_____

All Lot No.(s) Rocket _____ Motor _____ Igniter _____ etc.

Mark exterior box as follows:

DOT proper shipping name on top of box will be "Igniter, Rocket Motor, Class A - Explosives." Stencil or label on side of box will be nomenclature, "64-Igniter, Rocket Motor, M62 with Aquib M2,"

PN_____ Lot No.(s)_____ _____ _____

Box Gross Weight_____

*For package examples use package drawings 10048661 and 10048662.

Encl 5

Motor, for M55 Rocket

Insert motor fin assembly through the forward end of the M441 container to contact the aft end stops of the container. Shunt will be connected to the aft end plug and assemble end plug with the plug fin support contacting the motor fins. Tape a 1/2 inch fiber pad to the rear strut assembly stop and insert the strut assembly (see detail A) into the M441 container to contact the forward end of the Rocket Motor. Add fiber pads between the forward strut assembly stop and the forward end plug to obtain a tight fit. See firing and shipping container drawing 90-6-81.

Mark each M441 Container with label as follows:

The DOT marking will be "Rocket Motors, Class A Explosives."

PN/NSN_____ _____

Nomenclature - "Motor, Rocket M55 w/grain propellent M28, igniter M62, and Squib M2."

Lot No. (Motor)_____ (Rocket)_____

Placard pallet w/DOT marking (3/4 inch high letters, min.) on top of pallet

Tag two diagonal corners of the pallet showing, pallet weight, quantity, and pallet lot data. Palletize in accordance with drawing 90-6-62.

Warhead for M55 Rocket

Nail the forward stop piece to the strut of the strut assembly (see detail B) with 2-10d nails and tape a 3/8 inch (min.) to the stop piece. Insert the strut through the forward end of the M441 container to extend through the aft end of the container and install the rear strut assembly stop with 2-10d nails. Push strut into container and install rear container end cap.

Insert rocket Warhead into the container base first and install forward end cap to contact Warhead fuze to cap fuze support. Open rear container cap and push strut assembly forward to fully contact rear of Warhead. Add solid fiberboard pads between rear strut stop and rear container cap to obtain a tight fit and close rear container cap.

Roll M441 container with one wrap of 1/4 inch polyethylene sheet foam (solid or bubble) and place wrapped container in a polyethylene bag. Evacuate air from the bag by had (do not vacuum) and heat seal bag. Wrap bag with two wraps of fiberboard (single face) with corrugations outward and tape in place. Tape a fiberboard cap over each end of the container and tape in place.

Add a six inch wide strip of monofilament tape around the wrapped container at each pallet contact point (see detail B).

Mark the container, the bag, and fiber exterior wrap with a label as follows:

NSN or Part No._____ _____

Nomenclature "1-Warhead Rocket, M55 with M417 Fuze and Bursters M34/M36 (Drained and Plugged)."

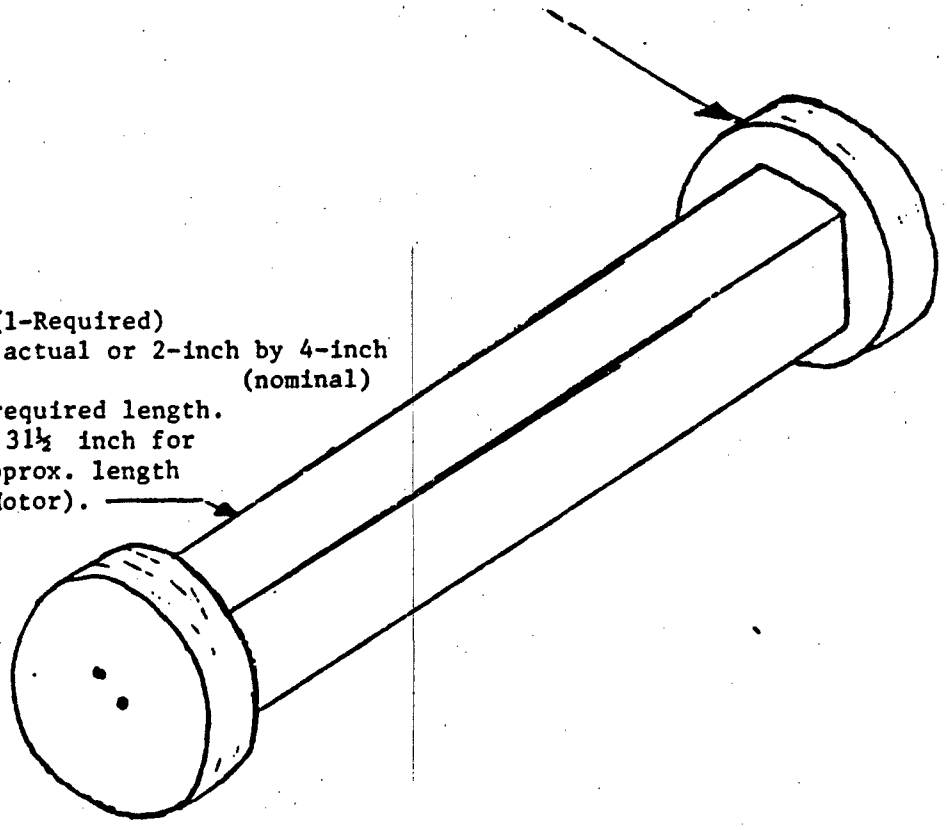
Lot No. _____ _____(Rocket, Warhead)

Gross weight.

Mark the top of the pallet with the DOT markings "Explosive Marking" (use a placard board) with 3/4 inch (min.) letter height and both "Explosive A" and "Poison Gas" labels. Tag pallet at two diagonal corners with pallet gross weight, quantity and all lot data.

Encl 7

Stop Piece (2-required)
Fabricate from 1-inch plywood or 2-inch by 4-inch material, approximate diameter 4 1/2 inches (cut to fit inside diameter of M441 container). Nail to strut w/2 - 10d nails as shown.



Strut (1-Required)
3-inch by 3-inch actual or 2-inch by 4-inch (nominal) material cut to required length. (approx. length 31½ inch for Warhead) and (approx. length 34 3/4 inch for Motor).

Detail A
Strut Assembly
(For blocking Rocket M55 motor or warhead in M441 container)

Note 1: When blocking the Rocket Motor, the M441 container strut assembly may be assembled before installation.

Note 2: When blocking the Warhead in the M441 container, the strut and forward stop should be assembled and installed in the container before the aft stop is attached, and before the Warhead is placed in the container.

Encl 8

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
SMCAR-ESK	Packaging of M441 Firing Tubes

TO AMSMC-DS FROM SMCAR-ES DATE 7 FEB 1985 CMT 1

Mr. Holcombe/nmw/4564

Subject packaging should be as follows:

a. Empty firing tubes.

(1) Tape all rough surfaces.

(2) Place a fiberboard "cap" over the ends of the tube.

(3) Wrap in kraft paper.

(4) Place in a bag constructed of 6 mil (minimum) thick polyethylene.

(5) Press excess air out and heat seal the bag.

(6) Roll the bagged tube in a sheet of single face fiberboard (PPP-F-320) with the fluted side out. Two complete wraps are required.

(7) Tape (PPP-T-97) the fiberboard in place.

(8) Place up to 12 tubes in a box (PPP-B-636 (WR), PPP-B-640, or PPP-B-621) and close in accordance with the requirements in the specification used.

(9) Mark in accordance with MIL-STD-129.

b. Sectionalized pieces of firing tubes.

(1) Cushion sharp edges with fiberboard and/or tape.

(2) Wrap in kraft paper.

(3) Place in a bag constructed of 6 mil (minimum) thick polyethylene.

(4) Press excess air out and heat seal.

(5) Wrap in cushioning material and place in a weather-resistant fiberboard box (PPP-B-636).

(6) Close in accordance with PPP-B-636.

(7) Mark in accordance with MIL-STD-129.

(8) Pack in a box complying with PPP-B-636, PPP-B-640, or PPP-B-621. (The quantity may be "as required" providing the weight limit of the box is not exceeded.)

(9) Mark in accordance with MIL-STD-129.

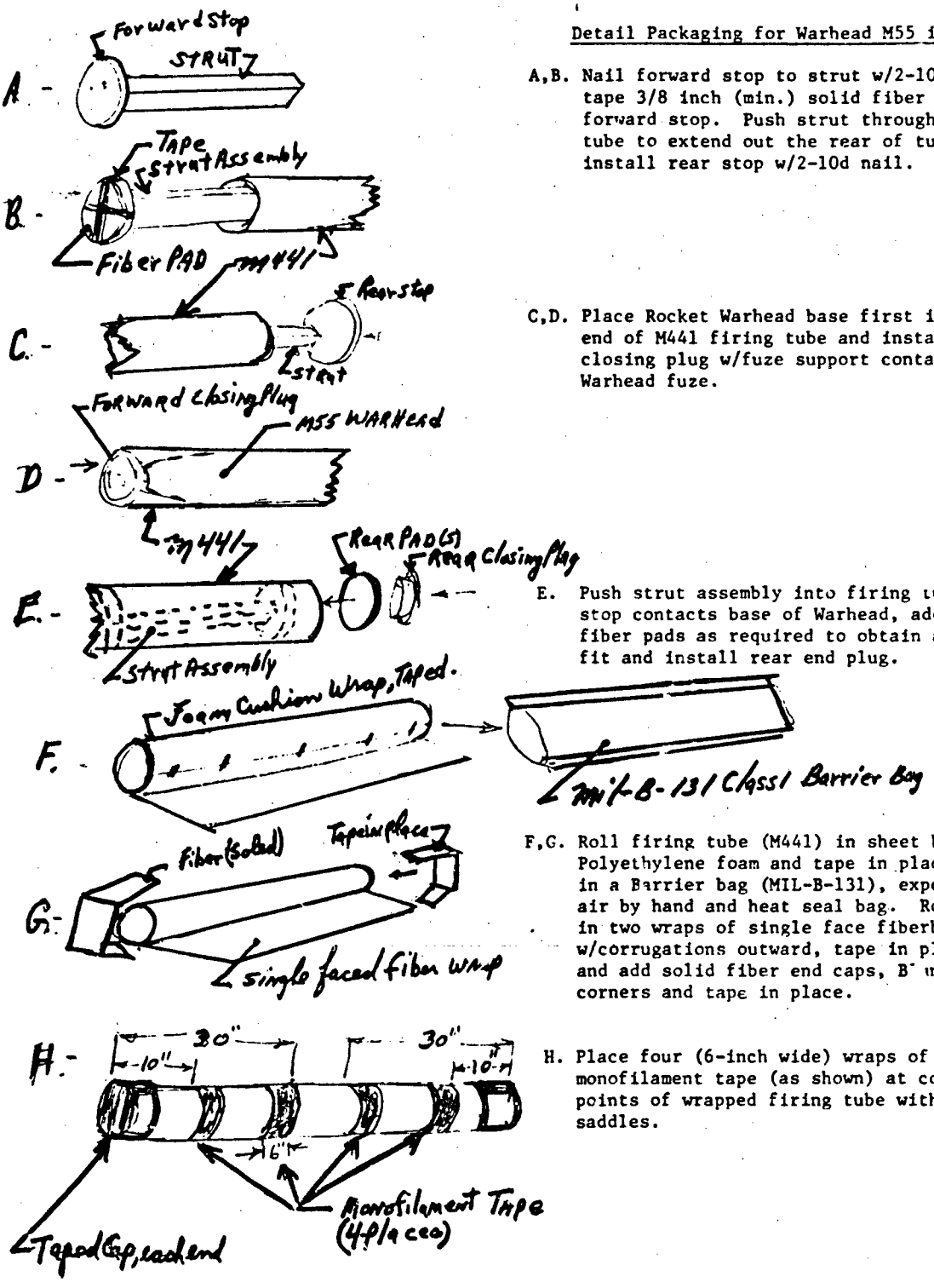
Encl 9

L J ARTIOLI
Director, Engineering Support Directorate

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

*U.S.G.P.O. 1982—363-545

Detail Packaging for Warhead M55 in Firing Tub



A,B. Nail forward stop to strut w/2-10d nail and tape 3/8 inch (min.) solid fiber pads to forward stop. Push strut through M441 firing tube to extend out the rear of tube and install rear stop w/2-10d nail.

C,D. Place Rocket Warhead base first in forward end of M441 firing tube and install forward closing plug w/fuze support contacting the Warhead fuze.

E. Push strut assembly into firing tube until stop contacts base of Warhead, add solid fiber pads as required to obtain a tight fit and install rear end plug.

F,G. Roll firing tube (M441) in sheet bubble or Polyethylene foam and tape in place. Place in a Barrier bag (MIL-B-131), expel all air by hand and heat seal bag. Roll bag in two wraps of single face fiberboard w/corrugations outward, tape in place and add solid fiber end caps, B[illegible]nt corners and tape in place.

H. Place four (6-inch wide) wraps of monofilament tape (as shown) at contact points of wrapped firing tube with pallet saddles.

APPENDIX C

M55 GB/VX ROCKET ASSESSMENT

SAFETY CONSIDERATIONS

APPENDIX C

Safety Considerations

I. General: All M55 rocket special assessment operations will be performed in a manner which precludes chemical agent release and also affords maximum safety to personnel and property, both private and public. Participating organizations will insure that all plans/procedures in this plan for which they are responsible are sufficiently detailed to assure they can be conducted in accordance with safety and health requirements contained herein and in references, appendix H. As a minimum, the following safety measures will be observed.

A. In all cases, a minimum number of people will be potentially exposed for a minimum period of time to a minimum amount of agent/explosive filled munitions consistent with safe and efficient operations. A list of operational checkpoints is provided in the Letter of Instruction for the Special M55 Rocket Stockpile Assessment.

B. Emergency procedures will be followed as detailed in the CAIC plan for each individual organization involved. Any operations not covered by a current and approved CAIC plan will be included in a revision to the plan prior to that operation being conducted.

C. DMWRs and SOPs will be prepared in advance for all M55 rocket special assessment operations that are not covered by applicable existing SOPs. Each SOP will provide, in detail, step-by-step procedures to include all necessary safety and health requirements. The SOPs will be approved by the commander or his designated representative having responsibility for the operation covered (see DARCOM/AMC Regulation 385-1 for detailed requirements for preparing SOPs).

D. Before any agent operations may commence, all personnel directly involved in the operation will be thoroughly trained in both the operational and safety and health requirements of their respective duties (see DARCOM/AMC Regulation 385-102, paragraph 7-2, for details on required chemical agent training).

E. Training to cover the duties and actions required under the appropriate CAIC plan will be provided. The responsibility for providing this training rests with the commander exercising control over the operations involved.

F. Pre-operational surveys will be conducted in accordance with DARCOM/AMC Regulation 385-102 before the start of operations. See enclosure 1 for further details.

G. Site plans/safety submissions or amendments to existing site plans/safety submissions will be prepared and approved IAW DARCOM/AMC Regulations 385-100 and 385-102, prior to starting M55 rocket special assessment operations.

H. Preliminary Hazard Analysis (PHA) has been performed on the operational steps as identified in Letter of Instruction for the Special M55 Rocket Stockpile Assessment. The PHA identifies the hazards and their probable causes. It provides recommendations to eliminate or control the hazards and presents a qualitative assessment of risk associated with each. Copy is on file with the M55 FTG.

II. Storage and Handling: Monitoring of storage facilities during handling operations shall be performed in accordance with paragraph 3-5 of DARCOMR/AMC REG 385-102. The following will be the minimum safety requirements:

A. Normal first entry monitoring procedures will be followed.

B. The selected rockets will be vapor sampled to below .2mg/m3.

1. Leaking rockets will be containerized but will not be processed. They will be placed in an assigned leaker storage area.

2. Any nonleakers will be repalletized and placed in a SPORT/M1 pig for transport to the processing area.

NOTE: All rockets transported will be containerized in either a pig or a SPORT, because of the possibility of generating a leaker during transport.

C. At the agent sample processing site, the containerized rockets will be vapor monitored to a level not to exceed .2mg/m3, to assure that no external leakers were generated during transport. Leakers detected will be containerized IAW SAB 742-1.

D. APE 1959.

1. After drilling, draining and flushing, the warhead a minimum of two times, but prior to further disassembly, certify the warhead agent cavity to below .2mg/m3. Use a chloroform extraction method to determine the exact level of decontamination. External decontamination will be verified with M-8 paper and a gross level detector prior to removal from the glove box.

2. Place the rocket in a plastic bag or other container so low level monitoring can be performed IAW DARCOM/AMC Regulation 385-102, to determine if the exterior of the item is decontaminated to the 3X level and safe for further handling. If item is not at or below the 3X level, it will be returned to the vapor containment area and further decontaiminated.

E. DATS.

1. To ensure propellant is not exposed to a contaminated atmosphere it must be removed prior to going into the DATS. (See paragraph III A, Disassembly.)

2. Item handling and external decontamination will be IAW normal DATS procedures.

3. Draining and flushing will be IAW paragraph II.F and III.D. below.

4. After removal from glovebox, place in a plastic bag.

5. Repeat procedures in paragraph II.D.2 above, until 3X decontamination is achieved.

F. After drilling, draining, and flushing the warhead a minimum of two times, but prior to further disassembly, certify the warhead agent cavity to below .2mg/m3. Use a chloroform extraction method to determine the exact level of decontamination. External decontamination will be verified with M-8 paper and a gross level detector prior to removal from the glove box.

III. SAMPLE PROCESSING:

A. Disassembly.

1. Disassembly of the rocket will be done at the motor-warhead junction. This disassembly may be done in vapor containment if removal can be accomplished without using undue force. Otherwise, total containment will be required. The rocket must be restrained in a manner to preclude damage to the warhead in the event of accidental ignition.

2. If the situation dictates, disassembly of a rocket motor from the drained warhead may be done using the APE 1240. The APE 1240 must be housed in a vapor containment room because there is a possibility of contamination behind the warhead base. Since undue force may be involved in using the APE 1240, personnel protection must be provided IAW DARCOM/AMC Regulation 385-100 and MIL-STD-398A and the operation performed remotely. If the warhead is not drained of agent, this operation will have to be accomplished under total containment due to the possibility of undue forces being encountered in removing the rocket motor from the warhead (DARCOM/AMC Regulation 385-102).

3. When removing the fuze from the warhead with undue force, total containment is required if the warhead is agent-filled. If the warhead is drilled, drained, and decontaminated to the level specified in paragraph II.G, then total containment is not required, although vapor containment will be required for removal of the fuze. For fuze removal operations of drained warheads; personnel protection must be provided as specified in DARCOM/AMC Regulation 385-100 and MIL-STD-398-A and the operation performed remotely.

4. All disassembly operations involving the warhead must be performed in vapor containment and will require monitoring to assure no agent has leaked into hidden areas, i.e., burster well, rocket motor, bulkheads, etc. For this reason, appropriate chemical agent protective clothing IAW DARCOM/AMC Regulation 385-102 will be required for disassembly operations. If contamination is discovered, further decontamination will be required.

5. Prior to removal of the rocket from the shipping and firing tube, the igniter cable must be shunted. Once the aft end cap has been removed from the M441, and anytime the rocket or rocket motor is out of the shipping container, it must be continously grounded and the igniter wire shunt cross bonded to the fin assembly or motor case. In its firing tube, the rocket motor igniter system has been determined to be safe from an EMR environment up to 200 v/m. When the rocket is outside the shipping and firing tube, EMR emissions will be controlled.

6. The risk associated with accidental ignition of propellant and explosive components has been addressed in the hazard analysis (HA) performed by the M55 FTG. This HA included the possibility of explosive/propellant exudates in the joints between rocket components such as the rocket motor to warhead juncture. Based on past exudate studies for the M55 rocket (studies identified in HA indicate exudates not sensitive), studies for a similar propellant grain for a RAP round, design of the rocket and the path of an explosive train required for initiation of propellant or explosive components, experience with disassembly of 1,007 M55 rockets at CAMDS without incident, and manual disassembly assembly of 700 M61 rockets by TEAD AED without incident, the performance of disassembly operations manually is of an acceptable risk. An explosive event (requiring remote operations and total containment) is considered highly unlikely. Undue force will not be used to separate warhead and motor. Disassembly torque is limited to 215 ft-lbs which provides a safety factor of approximately 1.8 based on tests with the M61 rocket.

7. All disassembly operations involving the M55 rocket warhead or contaminated components will be performed in a vapor containment chamber. Agent drilling, sampling and transfer operations will be performed in glove box equipment (APE 1959 or DATS).

8. Electrical grounding of the rocket motor igniter, motor case, equipment and operators is a requirement and is identified by the HA performed by the M55 FTG. Operators performing operations in agent protective clothing will wear leg stats and operate on conductive flooring. The butyl rubber gloves worn by the operators contain carbon black which makes them conductive; therefore, operators in chemical protective clothing can be grounded effectively. The vapor containment rooms where disassembly operations are performed will also be humidified to 60 percent to control any static build-up.

B. Agent Sampling:

1. All agent sampling operations will have to be performed in a vapor containment chamber with safeguards incorporated to preclude contact with explosive components IAW paragraph 6-5c.2 of DARCOM/AMC-R 385-102. Otherwise, total containment must be provided.

2. Liquid residue generated from flushing the agent cavity must be contained within vapor containment until it can be decontaminated to an acceptable (3X) level.

3. Agent samples must be properly packaged using established procedures, and the outside of the sample container must be decontaminated before the sample is removed from the vapor containment area.

C. Explosive Sampling:

1. Disassembly operations involving removal of explosive component samples, where there is the possibility of hidden agent contamination, will require vapor monitoring for determinations of levels of possible agent contamination. Personnel protection IAW DARCOM/AMC Regulation 385-102 is required when performing this operation.

2. Any machine operations on exposed explosives to obtain required samples will be performed in accordance with safety requirements of DARCOM/AMC Regulation 385-100, DARCOM/AMC Regulation 385-102, and MIL-STD-398A, i.e., remote operation, shielding, etc.

D. Metal Parts Decontamination:

1. In order to ship metal parts to organizations not having engineering controlled agent handling facilities, the parts must be decontaminated to a "clean conditional" status as described in DARCOM/AMC Regulation 385-102, paragraph 5-1a(4).

2. If metal parts are flushed using a flammable liquid, i.e., alcohol, chloroform, etc., then explosive vapor hazards must be considered for equipment selection and/or design.

3. Unless protected, the rocket fuze will be exposed to an agent atmosphere during drill and drain operations; therefore, it must be decontaminated to a 3X level and treated as such for transportation and during subsequent analysis. This will require that the analysis facilities be capable of handling agent contaminated items. If the fuze can be protected from agent contamination and certified clean (i.e., never exposed to agent) it may be shipped to ARDC for analysis.

IV. Sample Transportation:

A. Agent samples will be externally decontaminated and packaged IAW established procedures, and subsequent shipments must be escorted in accordance with AR 50-6 and AR 740-32. All shipping procedures must be IAW DARCOM/AMC Regulation 385-102, Chapter 10.

B. Clean explosive samples must be packaged and shipped in accordance with CFR, Title 49, Parts 171-179. Such samples, when shipped as clean (i.e., never exposed to agent contamination), must be certified as such by appropriate authority at the shipping location.

C. Explosive samples that have seen agent contamination, even following certification as 3X, can be shipped only to organizations having facilities for handling agent contaminated items.

D. Metal parts samples from M55 warheads shipped to organizations without facilities for handling agent contaminated items must be decontaminated to a "clean conditional" level. Any such samples which have not undergone 5X decontamination must remain under Government control.

Russell D. Hartwig

RUSSELL D. HARTWIG
AMCCOM Safety Office

CERTIFICATION OF OPERATIONAL READINESS

1. To assure operational readiness (i.e., proper equipment, adequate written procedures, trained operators, and compliance with safety recommendations) a pre-operational survey will be conducted at each of the six sites prior to conducting live operations. The M55 Functional Task Group (FTG) pre-operational survey team will include, as a minimum, knowledgeable individuals from the fields of safety, quality assurance, and ammunition maintenance.

2. Upon completion of a pre-operational survey, and after assuring that all recommendations have been implemented or resolved, a pilot "HOT RUN" will be conducted with one M55 rocket and M55 FTG member(s) observing operations. After successful completion of this pilot "HOT RUN" the installation can then build to their desired production rate.

3. Additionally, should more than 2 weeks of idle time elapse after the pre-operational survey has been completed, an additional follow-up inspection will be performed to confirm a continued state of operational readiness and implementation/resolution of all recommendations prior to conduct of live operations. The follow-up inspection will be performed by a qualified individual(s) designated by the M55 FTG.

APPENDIX D

M55 GB/VX ROCKET ASSESSMENT

LABORATORY ANALYSIS

APPENDIX D

Laboratory Analysis

I. OBJECTIVE: Characterize fuzes, propellants, explosives, shipping and firing tubes, and metal parts recovered from M55 chemical rockets.

II. EXPLOSIVE COMPONENTS:

A. Approach: Determine the safety aspects of the S & A of the M417 Fuze by the following:

1. X-ray all fully assembled M417 fuzes to establish out-of-line condition as delivered.

2. Subject 50 fuzes to transportation environment in a simulated warhead in a shipping package condition. X-ray after test.

3. Perform non-arm "g" limits in centrifuge tests on 50 fuzes. Examine annual gear "gap" condition.

4. Physical examination of parts for azide corrosion.

5. Tear down 50 S&A's and perform annular gear/rotor, spur gear/pinion, and escapement gear/pinion push-off tests. Prior to push-off tests, perform microscopic examination of parts for cracks, etc.

6. Perform 12, 5 foot drop tests in simulated rockets in various orientations. Criterion: Safe but not necessarily functionable.

B. Determine stability and sensitivity of energetic materials by the following:

1. Determine stabilizer content of each lot of M28 propellant in stockpile.

2. Conduct weight loss test on each lot of M28 propellant in stockpile.

3. Conduct stabilizer analysis in duplicate.

4. Determine the following for explosives in fuzes and bursters:

a. Impact sensitivity.

b. Autoignition temperature.

c. Vacuum thermal stability.

d. Shock sensitivity.

e. Differential thermal analysis/differential scanning calorimetry.

5. Conduct the program in phases as follows:

a. Phase 1: Determine stabilizer content of one sample from each of two motors from each propellant lot. Conduct explosives tests.

b. Phase 2: Determine stabilizer content of remaining two samples from each propellant lot. It is assumed that all of the proposed programs will be accomplished at ARDC, Dover, NJ. It may be necessary to substitute the exploding foil test for the small scale gap test if the explosive samples are too small.

C. Proposed Program:

1. Fuze S&A Characterization (94 Samples - Phase 1)

a. Establish Out-of-Line:

Condition

Material

b. Transportation Test:

Material

c. Centrifuge Test:

Material

d. Fuze Tear Down:

Material

e. Drop Tests:

Material

2. Propellant Analysis (392 Samples - Phase 1)

a. Sample Preparation.

b. Stabilizer Analysis.

1. 2 Samples/Lot.

2. 2 Samples/Lot (Additional).

3. 2 Samples/Lot (Additional).

c. Weight Loss Test.

d. Propellant Sensitivity (Function of Stabilizer Content).

1. Impact Sensitivity.

2. Explosion Temperature.

3. Vacuum Stability.

4. Differential Thermal Analysis/Differential Scanning Calorimetry.

3. Explosive Characterization M36/M34 Burster and Fuze Boosters (188 Samples - Phase I)

a. Sample Preparation.

b. Sensitivity Tests.

1. Impact.

2. Autoignition.

3. Vacuum Stability.

4. Shock Sensitivity.

(a) Small Scale Gap Material.

(b) Exploding Foil Material.

4. Operations/Tests Required for M2 Squibs/Fuze Detonators

a. Functioning test.

b. Disassembly.

c. Differential Thermal Analysis/Differential Scanning Calorimetry.

d. Vacuum stability.

e. Chemical Analysis.

5. Reports

a. Interim reports will be furnished weekly once testing has commenced.

b. Final report will be completed within 2 weeks following end of all test operations.

6. Sample Quantities Required

a. Propellant: N 50g/Sample

b. Explosive: N 65g/Sample

c. Fuze: Representative Sample

D. Time Required

1. Fuze Characterization: 150 working days (Phase 1 and 2).

2. Propellant Analysis: 282 working days (Phase 1 and 2).

3. Explosive Characterization:

a. With Small Scale Gap Test: 360 working days (Phase 1 and 2).

b. With Exploding Foil Test: 300 working days (Phase 1 and 2).

III. METAL AND FIBERGLASS PARTS ANALYSIS:

A. Field Examination:

1. Conduct visual observation on the metal and fiberglass parts before and after decontamination and disassembly of the rocket.

2. Based on field observation determine the size, number, and location of metal and fiberglass parts to be cut and shipped to AMMRC for metallurgical analysis.

Commander
AMMRC
ATTN: AMXMR-MMS (F. Chang)
Watertown, MA 02172-0001

B. Metal and fiberglass parts analysis to be done at AMMRC.

1. Metal parts required for examination:

a. Burster tube.

b. Burster tube/nose weldment joint.

c. Rocket skin-internal surface.

d. Metal parts from leakers and warheads which have never been filled, if available, for comparative evaluation.

e. Ball seals.

f. M417 fuze adapters exhibiting corrosion.

g. Other metal parts if necessary, based on field examination

2. Metal part analysis methods:

a. Characterization of micro structure by optical metallography, scanning electron microscopy, and transmission electron microscopy.

b. Characterization of surfaces by electron spectroscopy for chemical analysis and scanning ion emmission spectroscopy.

c. Corrosion and failure characterization. Corrosion characteristics: pit number, depth distribution, failure mode, leak path, if necessary.

d. Weldment defect characterization.

e. Chemical analysis of corrosion products, if any.

f. Propose corrosion/failure mechanism.

g. Assess effects of restabilized agent on metal parts.

3. Fiberglass parts required for examination:

a. Shipping containers.

b. End caps.

4. Fiberglass parts analysis methods:

a. Ultrasonic tests for voids/porosity.

b. Chemical/thermal tests.

- Resin Matrix.

- Glass structure determination.

c. Physical tests.

d. Mechanical tests.

- Hardness.

- Pressure limits.

- Impact strength.

- Tension/flexional strength.

e. Fire resistant/retarding capability tests.

f. Transportability tests.

g. Assess effects of restabilized agent on fiberglass parts.

C. Reports:

1. Preliminary: One month after arrival of metal parts at AMMRC.

2. Final: Depends on number of samples to be examined and its depth. Probable sample size will be 20-35 which will require 6 months for final report.

IV. AGENT ANALYSIS:

A. General:

1. Agent analysis will be conducted to characterize the general quality of agent remaining in the M55 munitions and to provide a rough prediction as to the remaining lifespan of this material and its relationship to present and future agent leakage.

2. The chemical analysis is structured to characterize the agent in terms of continued storage and/or disposal, rather than that which would be considered if the munition were intended for use.

3. Two types of agent analysis will be conducted.

a. The first of these will represent a general characterization of the M55 stockpile agent quality.

b. The second will be used as a means of projecting agent "lifespan" in the undemilitarized M55 rocket warheads.

B. General Characterization:

1. Replicative samples of agent from each munition sampled will be analyzed by programmed gas-liquid chromatography to determine purity, stabilizer content, and additional deleterious impurities.

2. Replicative samples of agent from each munition sampled will be analyzed by wet chemistry using the technique of the GB specification to ascertain strong acid content.

3. Replicative samples of agent from each munition will be analyzed using atomic absorption spectroscopy to determine aluminum (Al), nickel (Ni), copper (Cu), iron (Fe), and mercury (Hg) content.

4. The general characterization will be conducted by the laboratories at Dugway Proving Ground, and Pine Bluff Arsenal.

a. As a consequence of the comparative analysis effort done during recent SUPPLECAM tests, it is known that the results from these will vary by as much as 1 to 2 percent.

b. This is, however, more than sufficient to characterize the M55s for storage/demilitarization purposes, and determine where there are any major trends in the agent quality.

C. Prediction of Lifespan:

1. While a statistical sampling of the M55 will provide an assessment of the overall quality of the material and point out potential problems areas, it is nonetheless a single point in time and of little value in predicting the deterioration rate of the agent.

2. In order to make such a prediction, it will be necessary to subject a cross section of the samples to accelerated surveillance and compare the results to the kinetic models generated for the prediction of the lifespan of the current useful stockpile.

3. Accelerated surveillance at 100° C and 130° C will be conducted on nine agent groups representing the different initial agent qualities and storage conditions.

4. Agent used for these tests will be characterized by programmed gas-liquid chromatography and by Fourier Nuclear Magnetic Resonance Spectroscopy using P^{31}, C^{14}, F^{19}, and H^{1} spectra.

5. Metal ion content will be determined by emission spectroscopy and subsequent atomic absorption spectroscopy.

6. It is anticipated that data will be obtained within 6 weeks upon receipt of the samples.

D. Data Collection:

1. Data as collected by each laboratory will be reported to CRDC on a weekly basis.

2. The data will be collated and analyzed, with summary reports provided monthly.

3. At the completion of the program, a technical report detailing results of the effort will be published.

E. Reports:

1. Participating field laboratories at Pine Bluff Arsenal and Dugway Proving Ground will prepare final report on results of agent laboratory tests within 1 week following completion of a specific depot's samples. Report is to be forwarded to Commander, CRDC, ATTN: SMCCR-MU, APG, MD, with an information copy to Director, USAMSAA, ATTN: AMXSY-RW, APG, MD. Report format will be the same as specified for the SUPLECAM Program details of which were previously furnished participating laboratories by HQ, AMCCOM letter, DRSMC-QAS-N, dated 25 Aug 83, subject: Surveillance Program Lethal Chemical Agents and Munitions.

2. Final report or accelerated aging tests will be forwarded by CRDC to AMSAA within 3 weeks following completion of test.

ELIZABETH SLUDOCK
Chemical Research and Development Center

FRANK CHANG
Army Materials and Mechanical Research Center

DR. TILLMAN RICHTER
Armament Research and Development Center

APPENDIX E

M55 GB/VX ROCKET ASSESSMENT

MILESTONE CHARTS

M55 ROCKET STOCKPILE
ASSESSMENT PLAN MILESTONES

CHART NO. 2
5 MAR 85

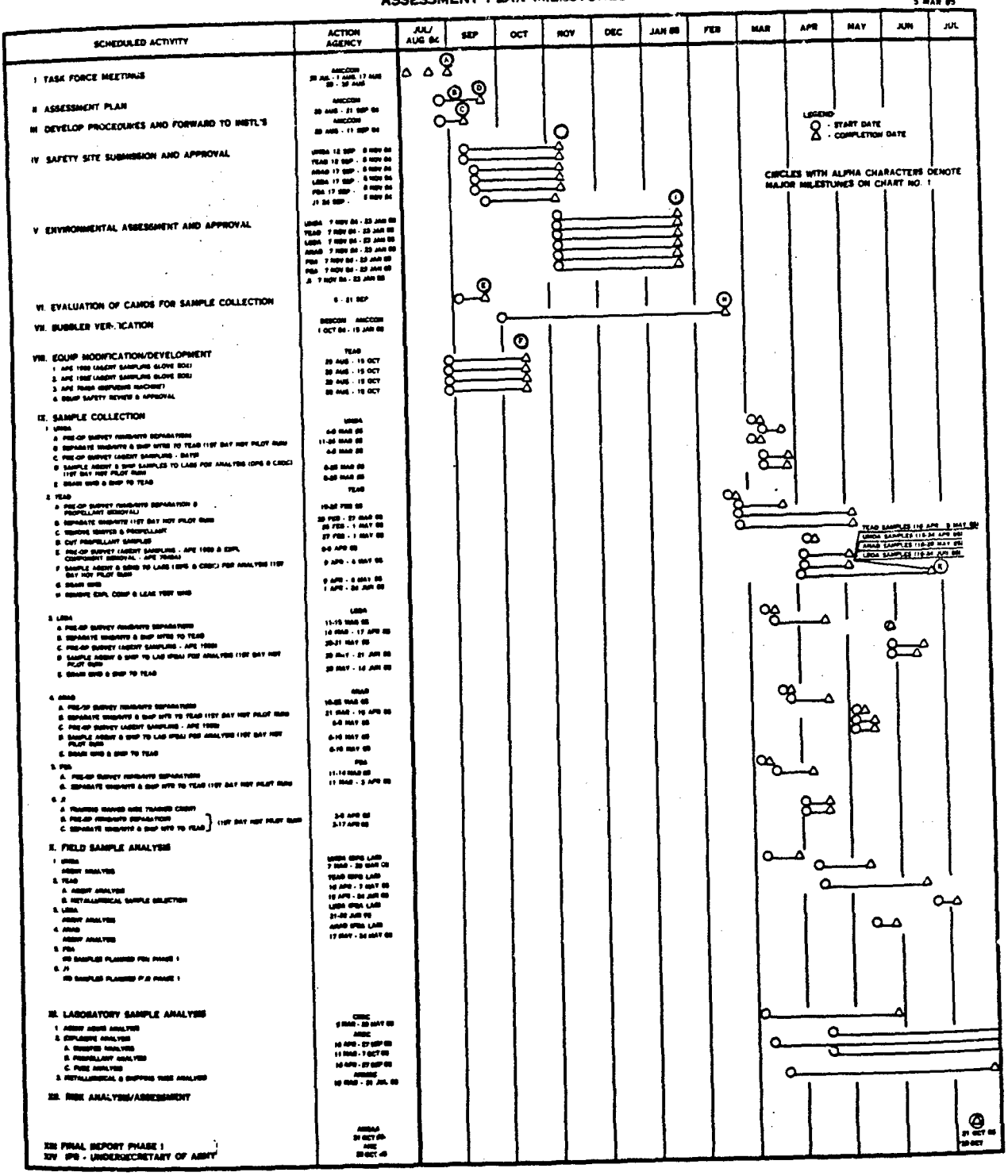


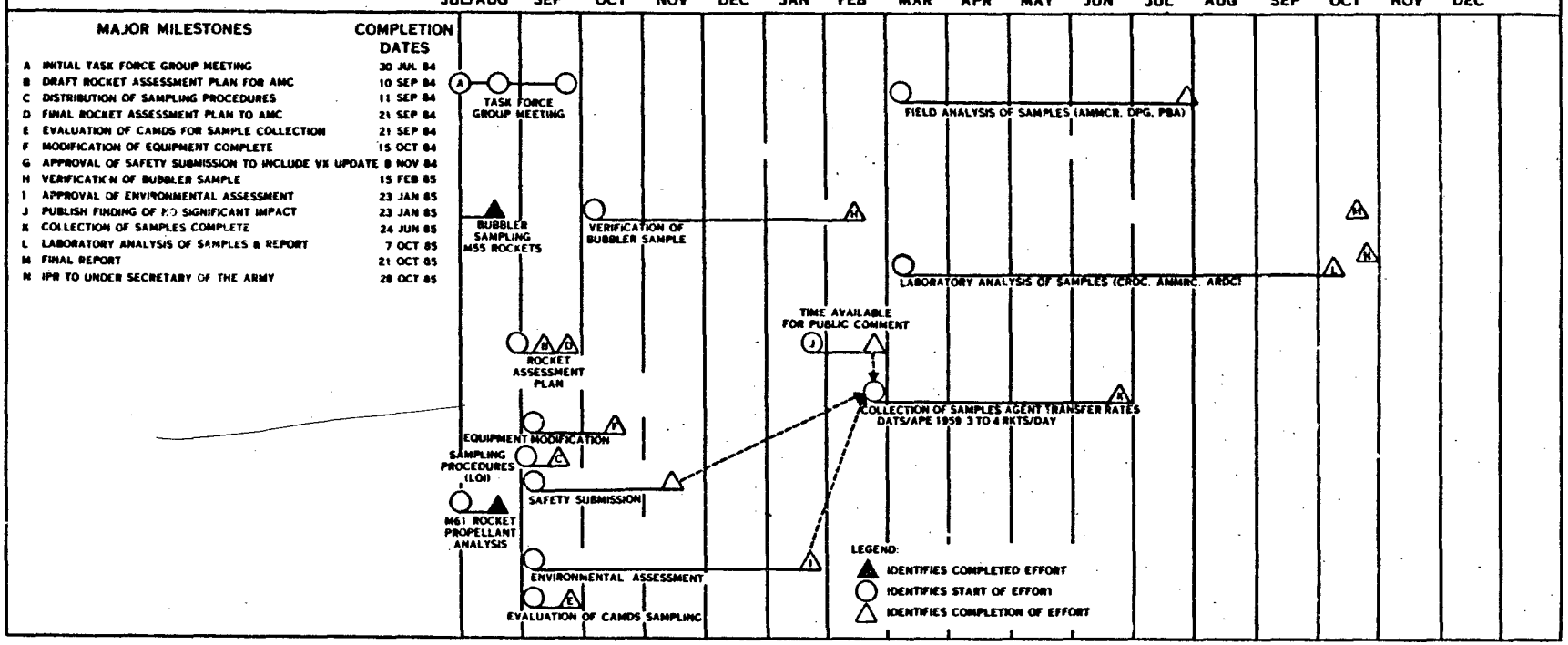
CHART NO. 1

5 MAR 85

M55 GB/VX ROCKET STOCK PILE ASSESSMENT PLAN

MILESTONES (PHASE I)

MAJOR MILESTONES	COMPLETION DATES
A INITIAL TASK FORCE GROUP MEETING	30 JUL 84
B DRAFT ROCKET ASSESSMENT PLAN FOR AMC	10 SEP 84
C DISTRIBUTION OF SAMPLING PROCEDURES	11 SEP 84
D FINAL ROCKET ASSESSMENT PLAN TO AMC	21 SEP 84
E EVALUATION OF CAMDS FOR SAMPLE COLLECTION	21 SEP 84
F MODIFICATION OF EQUIPMENT COMPLETE	15 OCT 84
G APPROVAL OF SAFETY SUBMISSION TO INCLUDE VX UPDATE	8 NOV 84
H VERIFICATION OF BUBBLER SAMPLE	15 FEB 85
I APPROVAL OF ENVIRONMENTAL ASSESSMENT	23 JAN 85
J PUBLISH FINDING OF NO SIGNIFICANT IMPACT	23 JAN 85
K COLLECTION OF SAMPLES COMPLETE	24 JUN 85
L LABORATORY ANALYSIS OF SAMPLES & REPORT	7 OCT 85
M FINAL REPORT	21 OCT 85
N IPR TO UNDER SECRETARY OF THE ARMY	28 OCT 85

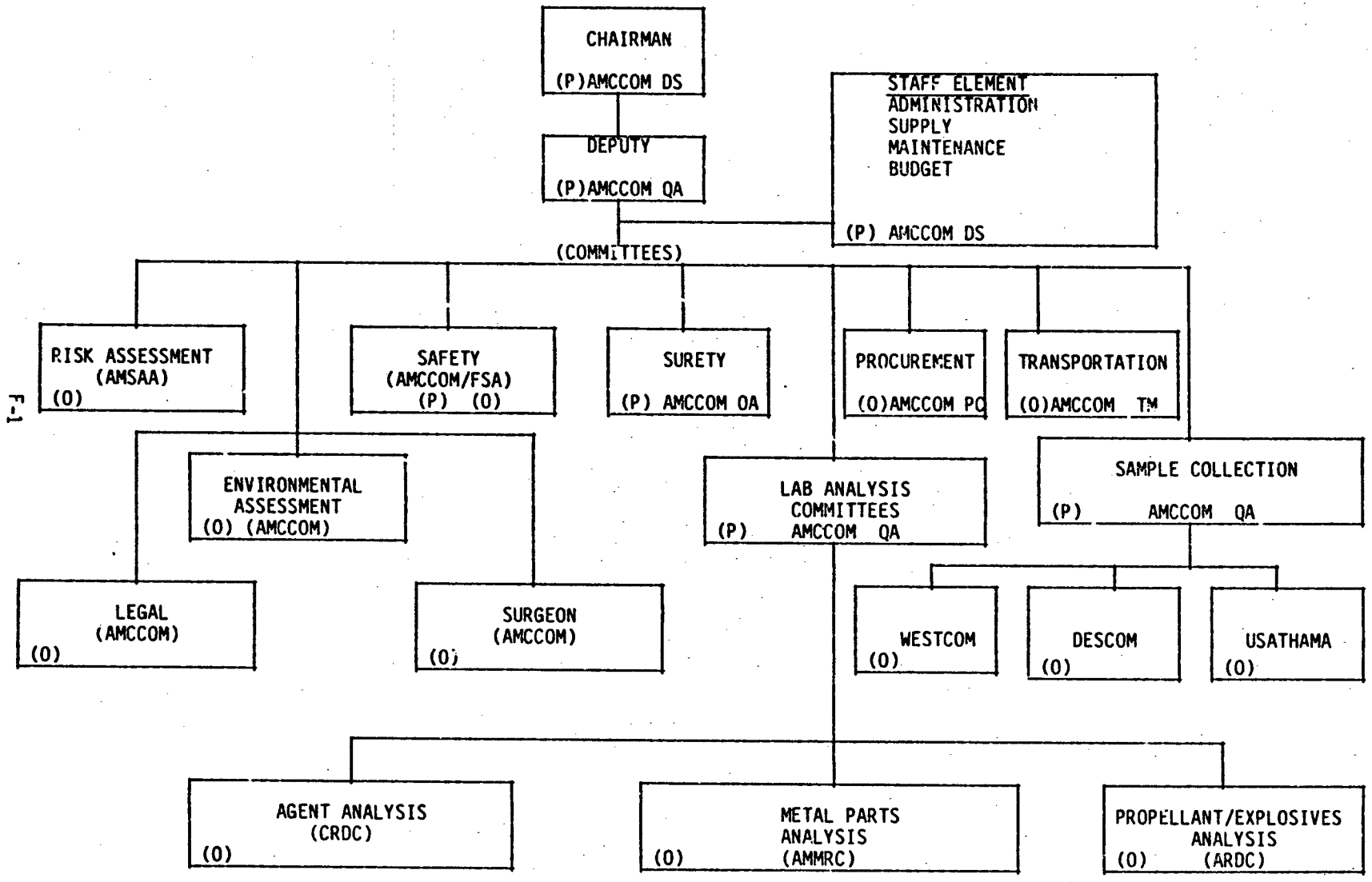


APPENDIX F

M55 GB/VX ROCKET ASSESSMENT

FUNCTIONAL TASK GROUP COMPOSITION

FUNCTIONAL TASK GROUP M55 GB STOCKPILE ASSESSMENT PLAN COMPOSITION



(P) - Permanent
(O) - On Call

APPENDIX G

M55 GB/VX ROCKET ASSESSMENT

TRANSPORTATION

APPENDIX G

TRANSPORTATION

1. The following plan is based upon conducting accelerated surveillance sample studies of the agent at CRDC and field agent sampling analysis at Pine Bluff Arsenal (PBA), AR, and Dugway Proving Ground (DPG), UT.

2. It is anticipated that Michael AAF located on DPG may be closed for a portion of the period 1 Mar 85 to 5 Jul 85. Michael will be considered the primary airport for shipments to or from Tooele Army Depot with Provo Municipal Airport, UT or Hill AFB, UT as alternates.

3. Movement of the accelerated surveillance samples will be effected as follows:

a. Umatilla Army Depot, OR via Army C12 aircraft or substitute mulit-engine fixed wing aircraft from Umatilla AAF (on depot) to Weide AAF, MD (on Edgewood Arsenal) for movement via government vehicle to CRDC. A minimum of two stops required for fuel. Visual flight conditions must prevail at Umatilla only. Pendelton, OR and Moline, IL are fuel stops.

b. Tooele Army Depot, UT via Army helicopter to Michael AAF, UT (50 miles) for Hill AFB (90 miles) (see paragraph 2) for movement via AMCCOM C12 type aircraft to Weide AAF, MD (on Edgewood Arsenal, MD) for movement via government vehicle to CRDC. One (1) stop required, Moline, IL.

4. Movement of the field agent samples:

a. Umatilla Army Depot, OR via Army multi-engined fixed wing aircraft from Umatilla AAF (on depot) to DPG, Provo, UT or Hill AFB (140) (see paragraph 2) for movement via helicopter to DPG, UT.

b. Lexington-Blue Grass Army Depot, KY via Army helicopter to Fort Campbell, KY, fuel stop, via Army helicopter to PBA, AR.

c. Anniston Army Depot, AL via Army helicopter to Calhoun County Airport, AL (10 miles) for movement via Army multi-engined fixed wing aircraft to Grider Field, Pine Bluff, AR for movement via Army helicopter to PBA, AR (13 miles).

d. Tooele Army Depot via Army helicopter to DPG, Provo, UT/Hill AFB (90 miles) (see paragraph 2).

5. Movement of the rocket warheads/motors:

a. Umatilla Army Depot, OR via Army multi-engined fixed wing aircraft from Umatilla AAF (on depot) to DPG, Provo, UT or Hill AFB (90 miles) (see paragraph 2) for movement via helicopter to Tooele AD.

b. Lexington-Blue Grass Army Depot, KY via Army helicopter to Fort Campbell for movement via Army mulit-engined fixed wing aircraft to Provo, UT.

c. Anniston Army Depot, AL via Army helicopter to Calhoun County Airport, AL (10 miles) for movement via Army multi-engined fixed wing aircraft, i.e., 5a.

d. Pine Bluff, AR via Army multi-engine fixed wing aircraft to DPG, Provo, UT/Hill AFB (90 miles) (see paragraph 2) for movement via Army helicopter to Tooele AD.

e. Anniston AD, AL via Army multi-engine fixed wing aircraft to DPG, Provo, UT/Hill AFB (90 miles) (see paragraph 2) for movement via Army helicopter to Tooele.

f. Travis AFB, CA via Army multi-engine fixed wing aircraft to DPG, Provo, UT/Hill AFB (90 miles) for movement via Army helicopter to Tooele AD.

6. Propellent samples:

Toocle via Army helicopter to DPG, Provo, UT/Hill AFB (90 miles) (see paragraph 2) for movement via Army multi-engine fixed wing aircraft to Morristown, NJ. Government vehicle from Morristown, NJ to ARDC.

7. The agent sample shipments and rocket warheads will be accompanied by a minimum of two technical escorts per shipment.

8. Shipment of fuzes, bursters, metal parts, and empty shipping and fitting tubes will be effected by commercial carrier service utilizing exclusive use of dromedary container or truck as appropriate to the size of the shipment and with necessary carrier furnished in-transit security service as applicable to the sensitive item/items being shipped.

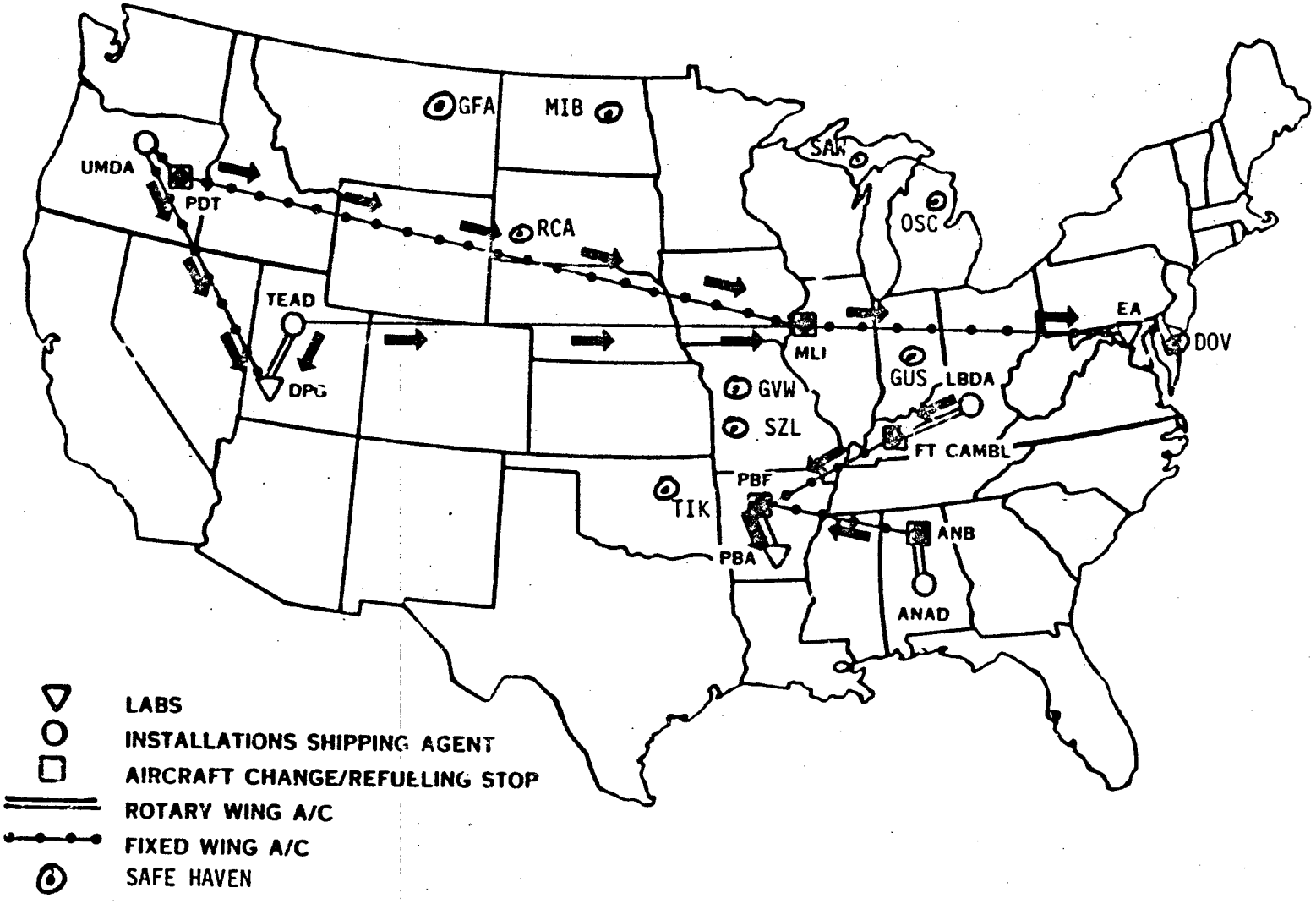
9/6/85

ROBERT J. SURKEIN
Director, Transportation and
Traffic Management Directorate

9/6/85

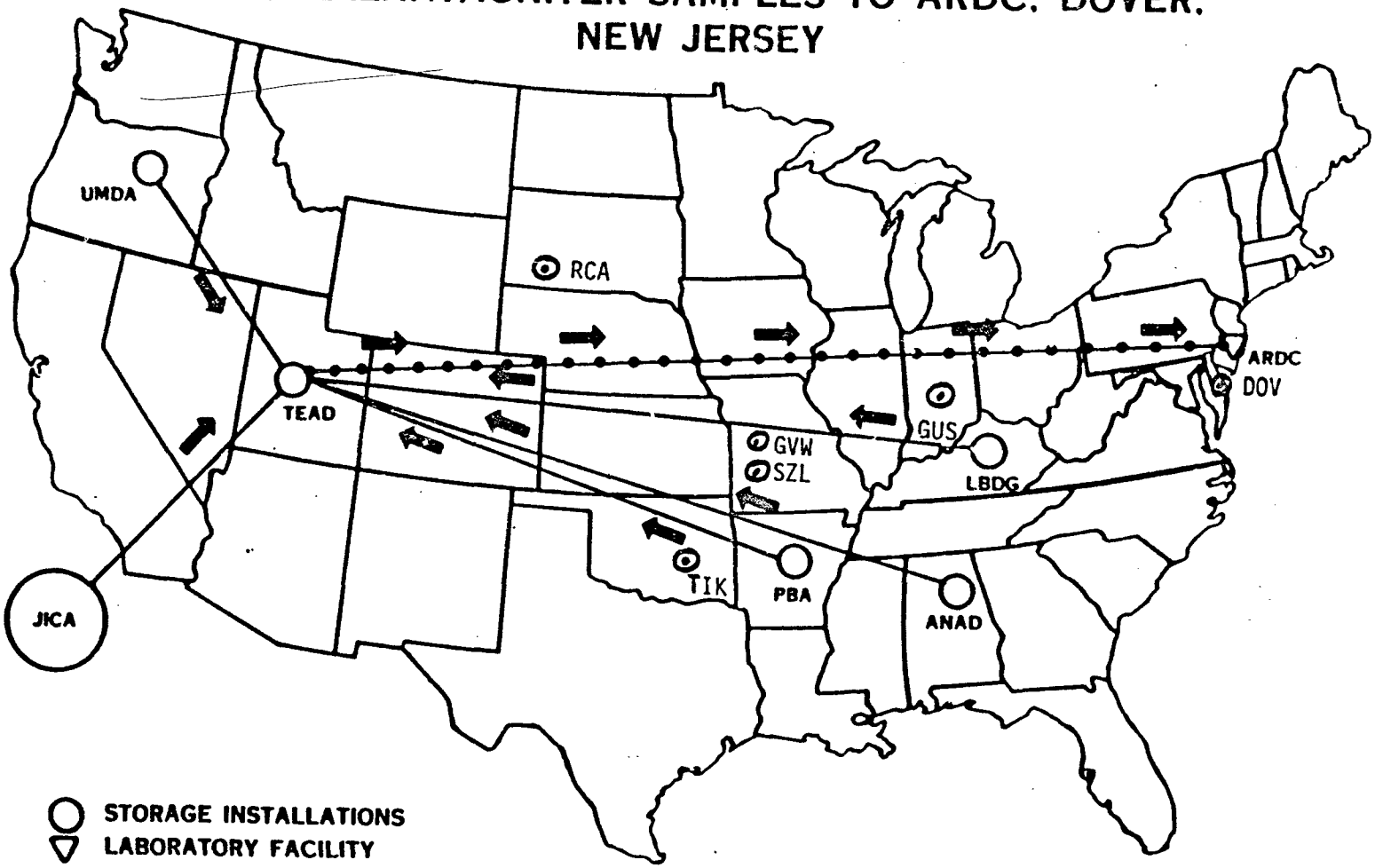
NEIL L. POBANZ, DAC
Chief, Aviation Office

AGENT SAMPLE MOVEMENT TO LABS
(DPG, PBA, CRDC)

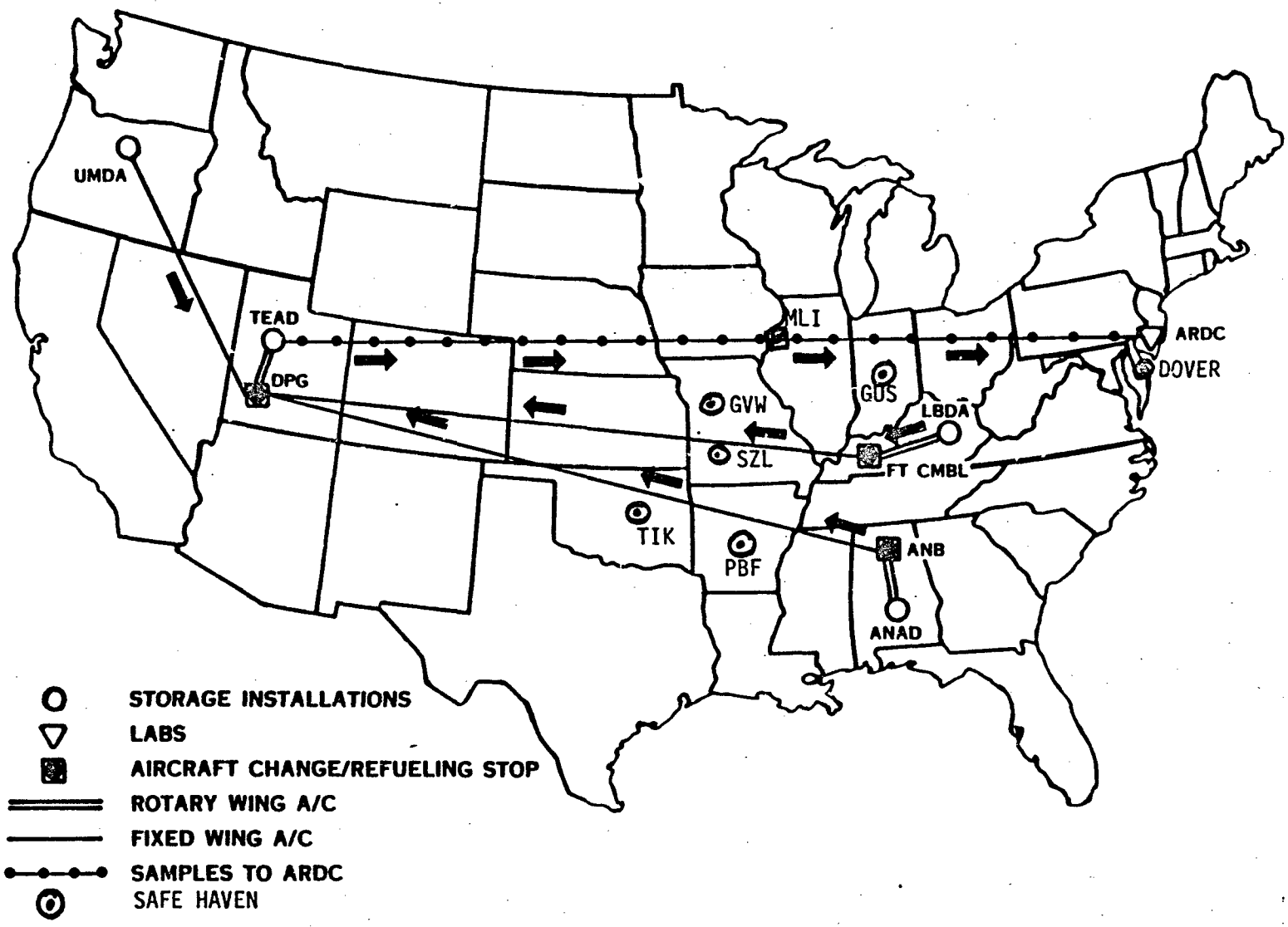


ROCKET MOTOR MOVEMENT TO TOOELE ARMY DEPOT TEAD UTAH

PROPELLANT/IGNITER SAMPLES TO ARDC. DOVER. NEW JERSEY



WARHEAD MOVEMENT TO TOOELE ARMY DEPOT (TEAD), UTAH
EXPLOSIVE SAMPLES TO ARDC, DOVER, NEW JERSEY



Key to three digit alphanumeric/aeronautical designators of airfields utilized for Technical Escort Unit missions and M55 Rocket Assessment Plan installations:

I. Airfields servicing depots/arsenals and OCONUS transhipment points:

ANB	Anniston - Calhoun County, AL
APG	Phillips AAF - Aberdeen Proving Ground, MD
DOV	Dover AFB - Dover, DE
DPG	Michael AAF - Dugway Proving Ground, UT
EDG	Weide AAF - Edgewood Arsenal, MD
PBF	Grider Field - Pine Bluff, AR
S41	Umatilla AAF, OR

II. Airfields servicing civil contractors:

GVW	Richards-Gebaur AFB, MO

III. Airfields utilized for enroute refueling stops and/or *crew change:

GUS	Grissom AFB, IN
HIF	Hill AFB, UT
*MLI	Quad Cities Airport - Moline, IL (RIA Flt Det)
*PBF	Grider Field - Pine Bluff, AR
PUB	Pueblo Memorial, CXO

IV. Safe havens/diversion airfields (weather/mechanical)

a. Primary

APG	Phillips AAF - ABerdeen Proving Ground, MD
DOV	Dover, AFB, DE
DPG	Michael AAF - Dugway Proving Ground, UT
EDG	Weide AAP - Edgewood Arsenal, MD

b. Secondary

GUS	Grissom AFB, IN
GVW	Richards-Gebaur AFB, MO
HIF	Hill AFB, UT

RCA Ellsworth AFB, SD

SZL Whiteman AFB, MO

c. Ancillary

GFA Malmstrom AFB, MT

MIB Minot AFB, ND

TIK Tinker AFB, OK

V. M55 Rocket Assessment Plan installations:

ANAD Anniston Army Depot, AL

DPG Dugway Proving Ground, UT

EA Edgewood Arsenal, MO

ARDC Armament Research and Development Center, NJ

LBDA Lexington-Blue Grass Army Depot Activity, KY

PBA Pine Bluff Arsenal, AR

TEAD Tooele Army Depot, UT

UMDA Umatilla Army Depot Activity, OR

JICA Johnston Island Chemical Activity, JI

APPENDIX H

M55 GB/VX ROCKET ASSESSMENT

REFERENCES

APPENDIX H - REFERENCES

General:

TB CML 73	Rocket Chemical 115mm (GB and VX Filled), Rocket, Training Dummy 115mm M60, and Rocket Practice, Simulant, EG, 115mm M61
FM 6-54	115mm Area Toxic System
TM 3-215	Military Chemistry and Chemical Agents
TM 3-240	Field Behavior of Chemical, Biological, and Radiological Agents
AR 75-15	Responsibilities and Procedures for Explosive Ordnance Disposal
AR 75-1	Malfunctions Involving Ammunition and Explosives

Technical Data Package for M55 Rocket

Accountability:

AR 735-5	Property Accountability Policy and Procedures
AR 735-11	Property Accountability Accounting for Lost, Damaged and Destroyed Property
AR 725-50	Requisitioning, Receipt and Issue System

Forms:

DD Form 134801	DOD Single Line Item Released Receipt Document

Ammunition Peculiar Equipment:

AR 700-20 with DARCOM/AMC Suppl 1	Logistics Ammunition Peculiar Equipment (APE)
TM 43-0001-47	Army Ammunition Data Sheets Ammunition Peculiar Equipment

Environmental:

AR 200-1 with Suppl	Environmental Protection and Enhancement
AR 200-2 with Suppl	Environmental Effects of Army Actions

Medical:

TM 8-285	Treatment of Chemical Agent Casualties
TM 3-215	Military Chemistry and Chemical Agents

Operations:

Draft DMWR 9-1340-H520-X20	Safing of the Igniter
Letter of Instruction (LOI)	for Special M55 Rocket Assessment (H520)

Safety:

DARCOM/AMC-R 385-100	Safety Manual
DARCOM/AMC-R 385-102	Safety Regulations for Chemical Agents GB and VX
AR 385-40	Accident Reporting and Records
AR 385-10, with DARCOM/AMC Suppl 1	Army Safety Program
AR 385-40 with DARCOM/AMC Suppl 1	Accident Reporting and Records
AR 385-32	Protective Clothing and Equipment
DA Pamphlet 40-8	Special Occupational Safety and Health Standards for the Evaluation and Control of Occupational Exposure to Agent GB
MIL-STD-398A	Military Standard for Shields, Operational for Ammunition Operations, Criteria, Design of and Test for Acceptance
DARCOM/AMC Reg 385-1	Preparation of SOPs
PRELIMINARY HAZARD ANALYSIS	M55 ROCKET STOCKPILE ASSESSMENT, 20 Oct 84

Security

AR 340-17	Release of Information and Records from Army Files
AR 380-86	Classification of Chemical Warfare and Biological Defense Information
AR 530-1 with DARCOM/AMC and AMCCOM Suppl 1	Operations and Signal Security (OPSEC)

Surety:

AR 50-6	Chemical Surety Program
FM 3-20	Technical Escort Operations
AR 740-32	Responsibilities for Technical Escort of Dangerous Materials

Surveillance:

SB 742-1	Ammunition Surveillance Procedures

Letter, HQ, AMCCOM, 8 Apr 76 with 1st Ind, HQ, DARCOM, 6 May 76, subject: Stockpile Reliability Testing

Storage:

TM 3-250	Storage, Shipment, Hand'ing, and Disposal of Chemical Agents and Hazardous Chemicals
TM 10-277	Protective Clothing for Chemical Operations
TM 743-200-1	Storage and Materiels Handling
DA Form 4508	Ammunition Transfer Record
SB 3-41	Receipt, Storage, Issue, and Disposal of Rocket, Gas 115mm, M60 and Rocket Practice, Simulant EG 115mm, M61
TM 3-220	Chemical, Biological, and Radiological (CBR) Decontamination

Transportation:

TM 38-250	Packaging and Materials Handling of Dangerous Materials for Transportation by Military Air
CFR Title 49, Parts	Hazardous Materials Regulations Shipping Container Specifications (Department of Transportation)

APPENDIX I

M55 GB/VX ROCKET ASSESSMENT

FUNDING/RESOURCE REQUIREMENTS

APPENDIX I

ESTIMATED FUNDING/RESOURCES REQUIREMENTS (FY 85)
(DOLLARS IN THOUSANDS)

7M 738017

I. Pre-operational Survey

Operation	Agency/ Installation	Manhours	Cost	Totals	
Motor/Warhead Separation	TEAD	1,172	.032	37.8	
	UMDA	507	.102	52.0	
	ANAD	400	.172	68.3	
	LBDA	400	.085	34.4	
	PBA	1,315	.045	59.2	
	JI	80	.013	1.1	
	JI (PBA)			42.9	
					$295.7
Agent Sampling	TEAD	1,865	.039	73.0	
	UMDA	312	.102	32.0	
	ANAD	240	.170	41.0	
	LBDA	432	.086	37.2	
	TEU (DATS)			15.1	
					$198.3

II. Sample Collection

Operation	Agency/ Installation	Manhours	Manhours/ Rocket	Cost Manhour	Rockets	Totals	
Motor/Warhead Separation	TEAD	1,512	15.75	.065	90	90.72	
	UMDA	1,674	27.00	.103	62	171.72	
	ANAD	1,360	25.20	.171	54	232.41	
	LBDA	2,416	60.40	.083	40	199.39	
	PBA	2,288	22.00	.033	104	75.30	
	JI	120	2.90	.014	42	1.66	
							$771.2
Agent Collection	TEAD	384	8.35	.063	46	24.31	
	UMDA				24	127.90	
	ANDA	416	26.00	.169	16	71.05	
	LBDA	89	11.20	.082	8	7.35	
	TEU (DATS)				24	45.10	
	PBA (DATS)				24	15.00	
							$290.71

III. Operations Supporting Sample Collection

Operation	Agency/ Installation	Cost	
Sample Transport	TEAD	39.6	
Removal of Propellant/ Disassembly of Grain/ Continuity Tests of Igniter	TEAD	358.2	
Toxic Moves	TEAD	23.1	
Saw Propellant Grain	TEAD	59.7	
Remove Fuze/Burster	TEAD	63.7	
Remove Adapter/Burster	TEAD	63.7	
Saw Warhead	TEAD	28.4	
Drums for Waste	ANAD	2.5	
Engineering Study	TEAD	36.6	
Site Preparation	PBA	35.0	
Sport Container/M1	PBA	39.5	
Static Fire Test (RRD)	PBA	12.3	
Blue Ribbon Panel	ARDC	1.5	
Support Requirements	PBA	25.7	$789.5

IV. Analytical Sample Analysis

Sample	Agency/ Installation	Cost	
Metal Parts	AMMRC	409.0	
Explosive	ARDC	533.0	
Agent	CRDC	533.0	
			$1,772.0

V. Transportation

Item	Agency/ Installation	Cost	
Agent Samples (TEU Escort)	All	32.27	
Agent Samples	All	67.3	
APE 1959		6.1	
Propellant Samples	All	109.52	
			$215.19

VI. TDY/Travel

Activity	Cost	
AMCCOM	120.0	
DESCOM	70.0	
AMMRC	22.0	
AMSAA	10.5	
THAMA	8.5	
		$231.0

VII. Equipment

Item	Unit Cost	Each	Cost	
Rocket Restraining Device	2.0	6	12.0	
Oven Vac	19.0	2	38.0	
Lab Ovens	8.0	4	22.0	
Accessories			56.6	
				$128.6

TOTALS

I.	494.00
II.	1,061.91
III.	789.50
IV.	1,772.00
V.	215.19
VI.	231.00
VII.	128.60

GRAND TOTAL $4,692.20

APPENDIX J

M55 GB/VX ROCKET ASSESSMENT

ENVIRONMENTAL ASSESSMENT

UMBRELLA DOCUMENT

ENVIRONMENTAL ASSESSMENT

FOR

THE M55 ROCKET STOCKPILE ASSESSMENT PLAN

JANUARY 1985

Approved by:

WAYNE C. BOYD
Colonel, GS
Chairman, FTG M55 GB Stockpile
Assessment Plan

Reviewed by:

for D. JOE GRIFFEN
AMCCOM OPSEC Officer

Reviewed by:

THOMAS J. WASH
AMCCOM Environmental Coordinator

Prepared by:

JENNIFER LEONARD
Environmental Protection Specialist

Reviewed by:

WILLIAM HASSELKUS
AMC Environmental Coordinator

JESSE GRANGER
Maintenance Management Specialist

Reviewed by:

BERNADINE MCGUIRE
Attorney-Advisor, AMCCOM, Office of
Counsel

1. Purpose of the Proposed Action

a. Purpose of the Proposed Action

(1) The purpose of the proposed assessment is to characterize the nerve agent filled M55 Rocket stockpile through a programmed composite of laboratory analyses. The test data derived from the analyses will be utilized to enable appropriate and educated decisions to be made regarding the ultimate disposition of the stockpile. Degrees of deterioration of the rocket components and warhead will be identified, together with any imminent hazard(s) imposed thereby, and to the extent feasible, an attempt will be made to predict future trends in deterioration.

(2) Although lesser in scope, operations involving sampling or demilitarization of chemical agent munitions have been successfully accomplished as part of Surveillance Lethal Chemical Agents and Munitions (SUPLECAM) for which an Environmental Assessment (EA) was prepared 12 July 1974; and the Drill and Transfer System (DATS) Program. No adverse environmental effects have resulted from SUPLECAM or DATS operations. A final Environmental Impact Statement (EIS) which addressed the DATS operations at Dugway Proving Ground, Utah, was filed on 25 October 1978.

(3) Sampling data previously obtained through the SUPLECAM program allowed characterization of only the agent itself, and did not specifically include M55 Rockets. In order to obtain data profiling the condition of all of the various rocket components, a sampling program as outlined in Appendix A, Letter of Instruction, has been proposed so that the hazardous components may be assessed. The Safety Submission and Site Plan, Appendix B, details the precautionary measures to be taken throughout the various assessment procedures.

b. Need for the Proposed Action

(1) The M55 GB Rockets, which were filled at Rocky Mountain Arsenal (RMA) from 1961 to October 1965 and the M55 VX Rockets which were filled at Newport AAP in 1961 and 1962 have recently been declared obsolete and designated for disposal. Both the GB and VX M55 Rockets share the same components, with the exception of the agent itself; therefore, samples will be taken to represent components of each.

(2) These items have posed particular challenges for the Army in view of the potential hazards posed during storage, transportation, and/or disposal. Disposal operations require a significant investment in manpower and facilities. The analysis of proposed disposal operations will consider whether or not an immediate or imminent hazard exists. To date, the surveillance program for these items has been limited to an in-storage visual and air sampling inspection to detect actual leakers in the stockpile. There has been no laboratory analysis program to assess the condition and safety of the explosives, metal parts, and agent components. Therefore, the exact condition of the stockpile and projections for future deterioration trends

remain unsubstantiated. The planned assessment is designed to provide a basis for determining the risks associated with continued storage of these items. Further, it will provide a scientific collection of data to support a timeframe for the ultimate disposal of the M55 Rockets.

2. Description of the Proposed Action

a. General

(1) The purpose of the assessment is to provide the Army with information on the present condition of the M55 Rocket stockpile. Representative samples of each component of the M55 Rocket, the fuze, bursters, propellant, igniter, agent, metal parts, and shipping container, will be tested and analyzed to characterize the stockpile at large. Sample collection will be conducted at six locations: Umatilla Depot Activity, Hermiston, Oregon; Tooele Army Depot, Tooele, Utah; Lexington Blue Grass Depot Activity, Blue Grass Facility, Richmond, Kentucky; Pine Bluff Arsenal, Pine Bluff, Arkansas; Johnston Island Chemical Activity in the Pacific Ocean; and Anniston Army Depot, Anniston, Alabama. Sample size requirements, selection criteria, and quantities per lot number have been determined and are discussed in greater detail in the Stockpile Assessment Plan (see reference 3). In addition to sampling, participation at Tooele Army Depot, Utah will be expanded to include receipt of the disassembled and agent drained warheads and rocket motor sections for processing as detailed in Appendices A and B.

(2) After completion of the disassembly and agent draining, samples of the rocket components will be sent to Army laboratories for analysis as follows:

(a) Armaments Research and Development Center (ARDC), Dover, NJ - propellant/igniter/burster/fuze.

(b) Chemical Research and Development Center (CRDC), Aberdeen Proving Ground, MD - agent accelerated aging tests.

(c) Army Materiel and Mechanic Research Center (AMMRC), Watertown, MA - metal parts.

(d) Dugway Proving Ground, Dugway, UT - field chemical analysis of GB agent.

(e) Pine Bluff Arsenal, Pine Bluff, AR - field chemical analysis of GB agent.

(3) Participation by the above laboratories as proposed for this mission is consistent with their current function, design, and operating capacity and will not result in any measurable degradation of environmental quality and, as such, no new or additional environmental considerations will be introduced. Additionally, these operations are covered by existing environmental documents for such operations at those facilities, and are

covered by Categorical Exclusion Number 11, as defined in AR 200-2. Appendices J through M demonstrate coverage of such activities at ARDC, CRDC, AMMRC, and Dugway Proving Ground via Categorical Exclusion and/or existing environmental documentation.

(4) Shipment of the samples from place of disassembly to Tooele Army Depot for further processing and to the respective analytical laboratories will be in conformance with all applicable regulations (i.e., EPA, DOT, DA, Federal, State, etc.). Agent samples will be transferred to laboratories for analysis by Army aircraft and all agent shipments will be accompanied by US Army Technical Escort personnel. The design of the agent sample shipping package exceeds the applicable DOT shipping requirements. As a result, this phase of the operation falls under the classification of normal, routine shipment of hazardous materials and is therefore covered by Categorical Exclusion Number 13, as defined in AR 200-2.

(5) During all phases of the operation, strict adherence to all applicable laws and regulations will be observed. Conformance with these laws and regulations ensures adequate environmental safeguards are in place. Every facet of the operation has been reviewed by DOD and independent contract safety experts. All elements of the sampling process as well as the personnel that will perform the tasks will undergo preoperational training and safety certification.

b. Location of the Proposed Operations

(1) Locations where the rockets will be disassembled and sampled are as follows:

(a) Umatilla Army Depot Activity, Hermiston, OR

(b) Tooele Army Depot, Tooele, UT

(c) Lexington Blue Grass Depot, Blue Grass Facility, Richmond, KY

(d) Anniston Army Depot, Anniston, AL

(e) Pine Bluff Arsenal, Pine Bluff, AR

(f) Johnston Island Chemical Activity in the Pacific Ocean

(2) Site specific descriptions and environmental analysis of these operations at the above locations have been individually prepared and are furnished at Appendices D through I. Laboratories designated to receive and analyze respective sample components are outlined in paragraph 2(a)(2) above.

(3) Site safety plans and approvals applicable to the sampling installations are at Appendix B. Additional safety considerations of the Department of Defense Explosive Safety Board are addressed in Appendix N.

c. Equipment and Facilities

(1) Site Layout

The individual Environmental Assessments (EAs) furnished at Appendices D through I contain detailed descriptions of the proposed operational sites and facilities to be used.

(2) Associated Equipment

(a) During disassembly of the rocket motor from the warhead, a hold-down device will be positioned in the vapor containment bay which will prevent movement of the rocket in the unlikely event of motor ignition. Appendices A and B contain a detailed description of the item itself.

(b) Drilling, sampling, and draining of the agent warhead will be accomplished in a negative pressure enclosure which exhausts through a series of activated charcoal filter banks. Monitoring will be conducted between the filters to assure breakthrough of agent to the surrounding atmosphere could not occur. Two sets of two activated charcoal filter units will be used. One pair in the series will be used as the primary filter set and the other pair in series will be used as a backup. Between each pair of filter units an M8 agent alarm will monitor for agent breakthrough from the first filter unit. Any agent breakthrough from the first filter is adsorbed by the second filter in the series. Upon agent breakthrough, the agent alarm will alert personnel who will then switch airflow to the backup pair of filter units while the primary filter units are replaced. Each of the four filter units has the capacity to remove the airborne contamination which would be present in the APE 1959. Low level monitoring of the final exhaust emission will provide a documented record that no agent has been released to the atmosphere. At all locations other than Hermiston, Oregon, a piece of Army Peculiar Equipment (APE) 1959 will be utilized. Umatilla will utilize the DATS program for this operational segment. The major differences between the DATS equipment and the APE 1959 are size and remote drill operations. These differences are not significant from an environmental standpoint since both are adequately large to accomodate the rockets and any agent release and positive stops are positioned on the drills in both cases so that penetration through the agent cavity and into the explosive burster material is virtually impossible

(3) Munition Description

(a) A detailed description of the M55 Rockets and cross-sectional diagram is contained in Appendix B. The rockets are stored and transported in sealed shipping containers which would normally preclude release of agent to the environment. Lethal nerve agent fill in the rockets is of two separate varieties -- GB and VX. Both are organophosphates which affect the nervous system by disrupting the chemical reaction which normally allows the muscle cells to relax after contraction by inhibiting action of the enzyme cholinesterase. Cholinesterase is necessary to clear the nerve cell synaptic area of acetycholine; otherwise, the cells continually contract causing spasms

which, in sufficient quantities, could lead to death. Routes of induction into the body can be by inhalation, absorption through the skin, or ingestion, with ingestion the least probable route of exposure.

(b) Chemical agent GB is readily hydrolyzed and is not persistent in the environment. Its military designed tactical use would be to clear an area and later inhabit it. The properties of VX make it more persistent, consistent with its military designed use of denying access to an area. While VX is more persistent than GB, requiring somewhat more effort to decontaminate, the dispersion and evaporative properties are substantially less, thus affecting a lesser area in the event of release.

(4) Decontamination - Incident/Accident Control

(a) Small quantities of agent which could be encountered during the operations as a result of leaks in the warheads can readily be contained and decontaminated at the site. Specially designed equipment containing ample supplies to decontaminate the entire contents of a rocket will be positioned immediately upwind of the activity sites and will also accompany the truck transporting the item to the operating facility. Methods for monitoring the atmosphere, soil, and resultant liquid recovered are reliable and capable of detecting extremely low concentrations (nanogram per milliliter range).

(b) An agent spill is clearly the most credible, although not probable, event to occur during the assessment operations. As discussed above, spills can be easily contained and decontaminated, thereby presenting no real environmental impact to the surrounding community. With the rocket locked in place in a hold-down device, detonation is extremely unlikely to occur because the fuse cannot be armed without the high degree of required acceleration. Also, historical data indicates that detonation of propellant during disassembly of the warheads from the rocket motors is extremely unlikely. However, a detonation of the munition, although highly improbable because of the safeguards surrounding the operations, must also be considered. Therefore, contingency plans are in existence and regularly practiced/exercised at each participating location. Additional information on accident/incident contingency plans is contained in the site specific Environmental Assessments outlined in Appendices D through I.

3. Alternatives Considered

Possible alternatives to the action are as follows:

(1) No Action

The no action alternative would involve retention of the rockets "as is" in their current storage configurations. Surveillance would continue to entail monitoring for agent vapor leaks, with isolation and overpacking of the culprit rockets. While this alternative would appear to have no adverse impacts immediately, the true condition of the stockpile in terms of relative stability could not accurately be determined. Since stabilizer in the

propellant grain has a life that is greatly dependent upon storage conditions (humidity, temperature, and air exposure), the urgency of demilitarization would be based upon data collected from propellant lot samples collected and stored under laboratory conditions at the time of manufacture. While it is possible that stabilizer depletion from these samples is faster than that within the rocket, it is also possible that depletion in the laboratory samples is slower. A spontaneous detonation of a rocket within its storage magazine could have significant environmental consequences since a substantially greater quantity of agent than the contents of a single round could be released. Therefore, this alternative is not considered a reasonable option.

(2) Transportation of the Rockets

Transportation of the rockets to one location for sampling and analysis would entail not only an increased hazard, but also great additional expense. Transportation of chemical munitions must be accompanied by a large number of security measures for escorting and safeguarding the items as well as notifications of all concerned. Additionally, not only would the act of transportation itself increase the likelihood of agent release through detonation, the potential non-military controlled property which could be potentially subjected to the effects of agent through detonation would obviously increase. This alternative offers no environmental benefit and is not considered preferable for economic and environmental reasons.

(3) Alternate Methodology for Sampling

The alternative of draining the rocket warhead prior to disassembly was considered in an effort to lessen the impact of the improbable event of detonation during motor removal. This option was also ruled out as the preferable alternative for the following reasons:

(a) Warhead detonation is equally improbable in both circumstances, thus a zero net gain would be realized.

(b) Draining of the warhead section first would introduce agent as well as other materials used in decontamination into the motor section. This could not only interfere with sample results, but could potentially introduce agent into samples intended for analysis at laboratories not equipped or approved for handling any quantities of lethal chemical agents. Therefore, this alternative was not selected.

4. Environmental Impact of the Proposed Action

a. General

(1) Laboratory testing and procedures will be conducted in established facilities designed and functioning for analysis of this nature, and are covered by Categorical Exclusion Number 11, as defined in AR 200-2. There will be no potential impact from introducing the proposed samples into

the designated testing facilities. No new or unusual circumstances will exist, therefore no significant environmental consequences are foreseen.

(2) Transportation of the samples will be conducted in accordance with applicable regulations and, as such, is covered by Categorical Exclusion Number 13, as defined in AR 200-2. No new or unusual circumstances will exist, therefore no significant environmental consequences are foreseen.

(3) Safety precautions utilized during the disassembly operations such as hold-down devices, vapor containment, detailed operator training, and procedural requirements as outlined in Appendices A and B make detonation of a warhead highly improbable. Should a motor function during disassembly, the hold-down device would prevent propulsion of the rocket. The propellant would burn until exhausted (less than two seconds) releasing heat as the only environmental effect. Such a release would not produce any serious impact on the environment.

(4) In accordance with established standards, the Maximum Credible Event (MCE) for chemical munitions which have explosive components assembled in them is based on functioning of the most disruptive component which would produce maximum release of agent. The propagation characteristics of the munition and damage to adjacent munitions sufficient to cause leakage of the agent filler is also considered. The MCE is used for accident/incident control purposes and does not reflect the unlikely probability of the event occurring. For this operation the MCE is based on either a single round detonation or detonation of two rockets with subsequent evaporative release of additional rockets. The MCE used by an installation is dependent upon whether single rounds or multiple rounds are transported. Hazard zone distance calculations are then performed using temperatures, wind speeds, atmospheric stability conditions, time of decontamination, agent characteristic, and type of surface representative of the operating conditions at each location. The meteorological conditions used are realistic worst case conditions for siting purposes and accident/incident control planning purposes. One percent lethality distances are not allowed to extend off post. The number of rockets transported and processed is controlled to assure that the one percent lethality distance remains on post. Unusual meteorological conditions (e.g., atmospheric inversions, unseasonal wind speeds and high temperatures, thunderstorms) which would extend the downwind hazard distances beyond those for the established MCE would cause operations to be curtailed. Thus, those distances plotted and shown in the site specific EAs are considered worst case. However, even in the worst cases, the hazard distances are relatively small and effective evacuation could be accomplished with minimal difficulty.

b. Conclusion

As discussed above, there is no adverse environmental impact likely to occur. In the unlikely event that a worst case (rocket detonation) should occur, the effects would not be of such a magnitude that the trained individual on the installations could not effectively control and contain the situation in a manner that no harm would ultimately effect the environment or

the personnel in the local community. Therefore, a Finding of No Significant Impact (FNSI) for this action will be prepared and published as applicable.

5. List of Agencies Consulted

a. Department of Defense Explosives Safety Board, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600

b. US Army Materiel Command Field Safety Activity, Charlestown, IN 47111-9669

c. Chemical Research and Development Center, Aberdeen Proving Ground, MD 21010

d. US Army Toxic and Hazardous Materiels Agency, Aberdeen Proving Ground, MD 21010

e. Armament Research and Development Center, Dover, NJ

f. US Army Materiel and Mechanics Research Center, Watertown, MA 02171-0001

g. US Army Armament, Munitions and Chemical Command, Rock Island, IL 61299-6000

h. US Army Western Command, Fort Shafter, HI 96858

i. US Army Depot System Command, Chambersburg, PA 17201

j. US Army Materiel Command, Alexandria, VA 22331-0600

k. US Army Technical Escort Unit, Aberdeen Proving Ground, MD 21010

TABLE OF CONTENTS

***Appendices are on file at each participating depot and laboratory.**

Billing Code: 3710-08-M

DEPARTMENT OF DEFENSE

FINDING OF NO SIGNIFICANT IMPACT

AGENCY: Department of the Army, Department of Defense

ACTION: Finding of No Significant Impact (FNSI) for the M55 Rocket Stockpile Assessment Plan. A comprehensive Environmental Assessment (EA) has been prepared which discusses the sampling operation to be used for characterizing the condition of the rocket components (agent, propellant, metal, explosive burster, and fuze) through a programed composite of laboratory analyses. The test data derived from the analyses will be utilized to formulate important decisions regarding the ultimate disposition of the M55 rocket stockpile.

Sample collection will be conducted at six locations: Umatilla Depot Activity, Hermiston, Oregon; Tooele Army Depot, Tooele, Utah; Lexington-Blue Grass Depot Activity, Lexington, Kentucky; Pine Bluff Arsenal, Pine Bluff, Arkansas; Anniston Army Depot, Anniston, Alabama; and Johnston Island in the Central Pacific.

The assessment plan consists of several steps. First, the rocket motor, which contains no agent, will be removed from the warhead and shipped to Tooele Army Depot for further disassembly and analysis. Next, the chemical agent will be drained from the munitions into specially configured containers and placed in storage on site. Then, the agent and propellant samples and remaining rocket components will be shipped to several specialized analytical laboratories. Finally, all samples and components will be analyzed.

Shipments of the samples and components will be in full conformance with all applicable regulations (i.e., Federal, State, Army). The agent samples will be transported in specially designed containers via military air accompanied by US Army Technical Escort Unit personnel.

The proposed plan was selected after extensive study of several other options. Initially, the decision was made to conduct the rocket assessment instead of continuing the status quo of normal stockpile monitoring and surveillance procedures. Then, the proposed plan was selected over two other options: (a) transporting the rockets to one location for disassembly, sampling and analysis; and (b) draining the rocket warheads prior to disassembly. The proposed plan appears to be optimum based on comparisons of safety, effectiveness, process simplicity, environmental impact and cost.

The Finding of No Significant Impact was established after consolidating site specific environmental assessments developed for each of the six sites. Because of safeguards built into the operation and contingency plans which have been developed for the extremely remote possibility of agent release and rocket detonation, no adverse environmental impact is associated with the M55 rocket assessment. Accordingly, an Environmental Impact Statement (EIS) is not required.

The complete Environmental Assessment, which includes all participating installations, is incorporated by reference and copies may be obtained from the Commander, Armament, Munitions and Chemical Command, ATTN: AMSMC-DS (M55 Functional Task Group), Rock Island, Illinois 61299.

Copies of the specific environmental documentation for each storage site may be obtained from the following locations:

Commander, Anniston Army Depot
ATTN: SDSAN-DAS-FE
Anniston, Alabama 26201

Commander, Lexington-Blue Grass Depot Activity
ATTN: SDSAN-LAF
Lexington, Kentucky 40507

Commander, Pine Bluff Arsenal
ATTN: SMCPB-EM
Pine Bluff, Arkansas 71601

Commander, Tooele Army Depot
ATTN: SDSTE-ASF-E
Tooele, Utah 84074

Commander, Umatilla Depot Activity
ATTN: SDSTE-UA-CO
Hermiston, Oregon 97838

Commander, WESTCOM
ATTN: APEN-ISF
Fort Shafter, Hawaii 96858

Written public comments concerning this proposed action should be sent by February 12, 1985 to Commander, Armament, Munitions and Chemical Command, ATTN: AMSMC-DS (M55 Functional Task Group), Rock Island, Illinois 61299.

Lewis D. Walker
Deputy for Environment, Safety
and Occupational Health
OASA(I&L)

APPENDIX K

M55 GB/VX ROCKET ASSESSMENT

ACCOUNTABILITY PROCEDURES

APPENDIX K
Accountability Procedures

Complete accountability of selected sample rockets and sample components generated in the sampling process will be maintained at all times. The following procedures will apply on sample collection for the M55 rocket (H520) stockpile assessment plan. The procedures cover both the assets currently on the AMCCOM accountable records or to be returned to the accountable records and the procedures to be followed in shipments from the disposal account 11P to test facilities and subsequent return to either the 11P account or accountable records.

A. AMCCOM Accountable Record (B14).

1. Each installation except Johnston Island will notify AMCCOM, AMSMC-DSD-AS, by priority message 2 days prior to the sample collection start-up of the number and type of rockets that can be processed in 30 day increment (encl 1).

2. AMCCOM, AMSMC-DSD-AS, will issue a materiel release order (MRO) (encl 2) releasing the M55 rockets from the B14 wholesale account to the depot designated accountable account (sample collection account). The MRO will release the quantity that can be processed within a 30 calendar day timeframe. Storage locations will insure that the quantity and lot numbers selected are specifically designated as sample candidates in the M55 rocket assessment plan. The MROs released by B14 will contain W52H09 in the first six positions of the document number field.

3. Materiel release confirmation (ARO) (encl 3) is required on all transactions. AMCCOM retains accountability until the ARO is issued, at which time the accountability is passed to the accountable officer of the depot account. The ARO message requires serial number control in accordance with AMCR 740-17, chapter 3.

4. Johnston Island will take the following action in preparing the rocket motors for shipment to Tooele Army Depot.

a. Rockets designated for disassembly will be disassembled and on a weekly basis the number of rockets disassembled will be posted to custodial records as a loss on document identifier code D9J (encl 4). Weekly D9Js will be required until the 42 samples have been generated.

b. An equivalent number of warheads will be reported concurrently with paragraph 4a action on document identifier code D8J (encl 5). Warheads will be identified as follows:

(1) 8136190-2-63VX Warhead, Rocket Chem M56VX and/or

(2) 8136190-2-63GB Warhead, Rocket Chem B56BG.

The D8J actions will be posted to the custodial records and forwarded with D9J actions to CDR AMCCOM ROCK ISL IL //AMSMC-DSC//. Message reporting paragraph 4a and 4b actions require serial number control in accordance with AMCR 740-14, chapter 3.

c. The sample rocket motors generated from disassembly action will be maintained on a local stock record account. When the motors are shipped a copy of the shipping document will be forwarded to HQ, AMCCOM, ATTN: AMSMC-DSD-AS (encl 6).

5. Surety materiel generated from the sampling program, but not required for sampling or the accumulated sample quantity upon completion of sampling will be reported to AMCCOM (B14) utilizing document identifier code D6J (encl 7). The following applies:

a. Quantity reported to B14 will be expressed in unit of issue of lbs. The initial gains may be determined by multiplying the quantity in a round by the total number of rounds drained in the operation.

b. Locations with calibrated scales will weigh the container(s) upon completion of the assessment and make the inventory adjustments accordingly.

c. DD Forms 173 (Joint Message Forms) will contain statement that the quantity being reported is a. estimated, b. verified (weighed) as appropriate.

6. Above transactions will be accomplished on DD Form 173 in accordance with AMCR 740-17, chapter 3 utilizing document content described therein and AR 725-50.

7. The above procedures are an iteration of those contained in AMCR 740-17, chapter 3 with no deviation intended.

B. Accountable Records - Storage Locations

1. Storage locations generating samples will control materiel on site with the DA Form 4508 Ammunition Transfer Record (encl 8).

a. The DA 4508 will be initiated at the time the end rounds (rockets) are removed from storage and will track the items through final disposition.

b. Final disposition will include.

(1) Components returned to storage.

(2) Components shipped to test location.

2. DD Form 1348-1 (encl 10) will be used for a. shipment of major components to sample preparation site, or b. shipment of samples to test facilities (encl 6) is sample shipping document A5_. Components generated from the sampling process but not required for sampling will be processed as follows:

a. Warheads containing agent and bulk agent generated from the draining of warheads will be returned to the wholesale account on Document Identifier Code (DIC) D6J (encl 7).

b. The balance of components will be retained in the account identified as indicated on enclosure 11.

c. Those components not requiring demilitarization will be retained in the 11P account until specifically released by the M55 rocket assessment group and/or the moratorium on shipments to the Defense Property Disposal Office (DPDO) is lifted whichever occurs last. The assets will then be transferred to the DPDO. It is important that the Federal Stock Class Manager (FSCM) drawing number identified on enclosure 11 be used to identify DPDO candidates in the 11P account to facilitare the purging of the assets.

3. Shipment of agent samples will be in accordance with the HQ AMCOM Transportation of Chemical Materiels in support of RDTE (OPLAN RDTE) dated November 1984. In addition to the shipping document enclosure 6 the forms at enclosure 12 through 14 will be required. The following applies.

Enclosure 12, DD Form 1387-2, Special Handling Data/Certification
Enclosure 13, DD Form 626, Motor Vehicle Inspection
Enclosure 14, DD Form 1911, Materiel Courier Receipt

4. A recapituation of actions required are attached as figures to enclosure 15 as follows:

Figure 1 Accountable/Custodial record impact at each location from assessment action.

Figure 2 Recap of action required at storage locations.

Figure 3 Actions required of test facilities upon completion of test.

Thurman Bouse

15 Encl
as stated

THERMAN BOUSE
Chief, Defense Accountibility
and Logistics Data Division

CDR APPROPRIATE INDICATOR OF SENDER

CDR AMCCOM ROCK ISL IL //AMSMC-DSD-AS//AMSMC-DSC//

UNCLAS

SUBJ REQUEST FOR MATERIEL RELEASE ORDER (MRO)

REFERENCE A: M55GB ROCKET (H520) STOCKPILE ASSESSMENT PLAN DATED 21 SEPT 84 (U)

1. REQUEST MRO BE ISSUED TO THIS DEPOT, TRANSFERRING TWENTY (20) 1340H520 ROCKETS TO THE 11P ACCOUNT FOR THE PURPOSE OF EXTRACTING APPLICABLE SAMPLES SPECIFIED IN REFERENCE A.

2. THE ABOVE QUANTITY WILL BE PROCESSED WITHIN THE 30 DAY TIME FRAME ESTABLISHED BY APPENDIX K REFERENCE A.

SAMPLE

MESSAGE DOES NOT REQUIRE SERIAL NUMBER CONTROL

Encl 1 to Appendix K

CDR AMCCOM ROCK ISL IL //AMSMC-DSD-AS/AMSMC-DSC//

CDR APPROPRIATE INDICATOR OF REQUESTOR

UNCLAS

SUBJ MATERIEL RELEASE ORDER (MRO)

REFERENCE A: UR MAY 021530Z FEB 85 (U)

1. THE FOLLOWING MRO PROVIDED PER YOUR REQUEST REFERENCE A:

ASE/BTD/O/134007161450/EA/00020/W52H09/5004/A000 O/Y00000/M/GJ/BLNK/

BLNK/15/BLNK/814 AH/

TRANSFER TO ACCOUNT FOR M55 RKT ASSESSMENTS.

2. MATERIEL RELEASE CONFIRMATION REQUIRED

REFERENCE AR 725-50 FOR DOCUMENT CONTENT DESCRIPTION

NOTE: USE 134007161450 GB

134007243567 VX

ENCL 2 TO APPENDIX K

CDR APPROPRIATE INDICATOR OF SENDER

CDR AMCCOM ROCK ISL IL //AMSMC-DSD-AS/AMSMC-DSC//

UNCLAS

SUBJ MATERIEL RELEASE CONFIRMATION (MRC)

REFERENCE A: UR MSG 041200Z FEB 85 (U) SER NO 00-85

THE FOLLOWING MRC PROVIDED PER YOUR REQUEST REFERENCE A.

1. AR0/B14/0/13400716l450/EA/00020/W52H095000A000/BLNK/GA/BLNK/1//

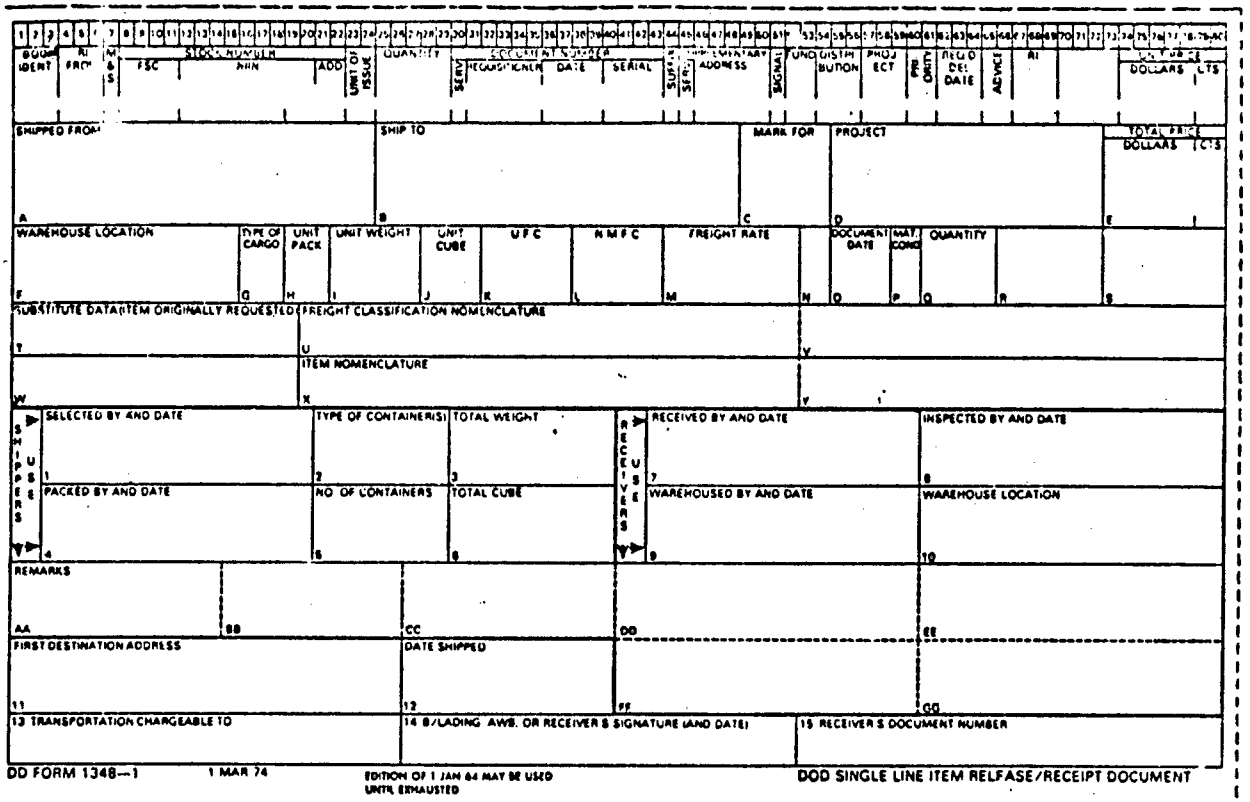
15/2//8 /

1/ DATE SHIPPED

2/ TCN/GBL NO

REFERENCE AR 725-50 FOR DOCUMENT CONTENT DESCRIPTION

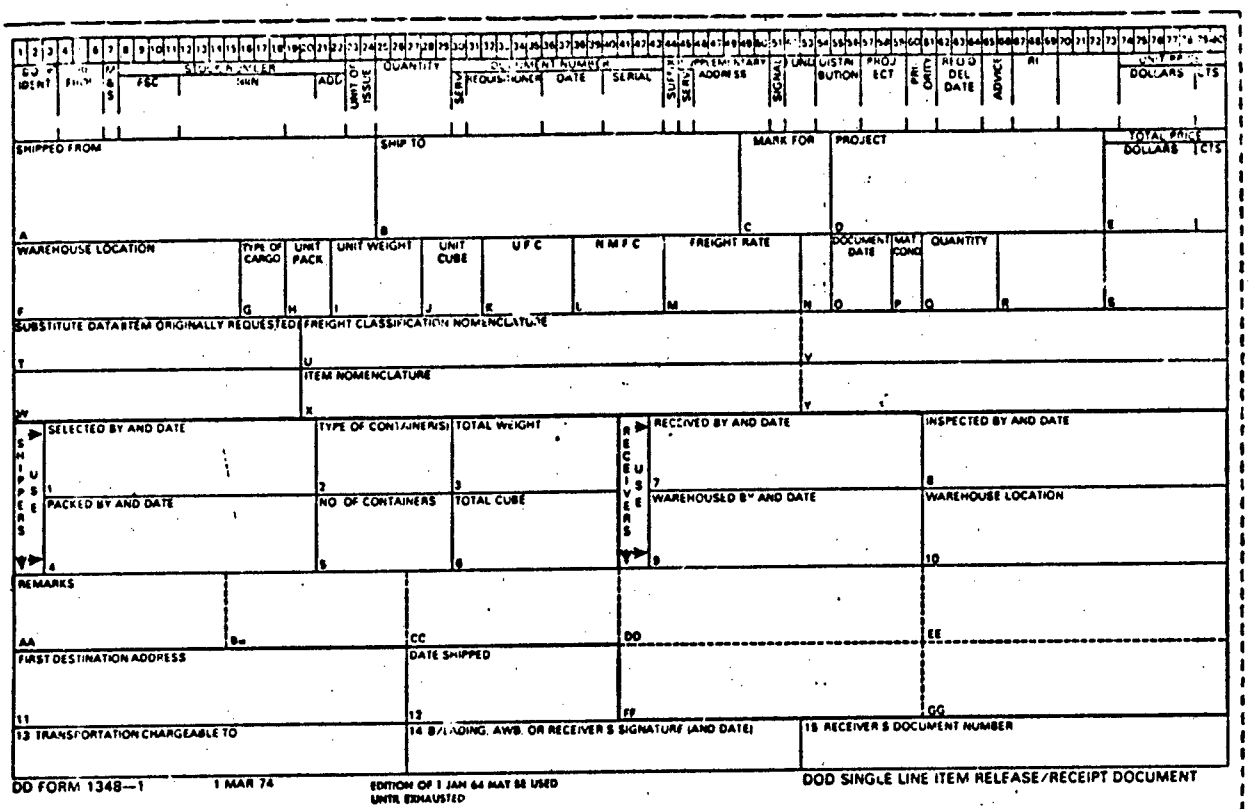
ENCL 3 TO APPENDIX K



DD FORM 1348—1 1 MAR 74 EDITION OF 1 JAN 64 MAY BE USED UNTIL EXHAUSTED

DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

CC 1- 3 D9J
4- 6 Routing Identifier Code to whom the document is being sent
7 Blank
8-22 NSN or FSCM/Drawing No (encl 11)
23-24 Unit of Issue EA or LB
25-29 Quantity
30-43 Storage Location Assign Document No
44 Blank
45-51 Blank
52-66 Blank
67-69 Routing Identifier Code Storing Materiel
70 A
71 Condition Code of Materiel
72-80 Blank



CC 1- 3 D8J
4- 6 Routing Identifier Code to whom the document is being sent
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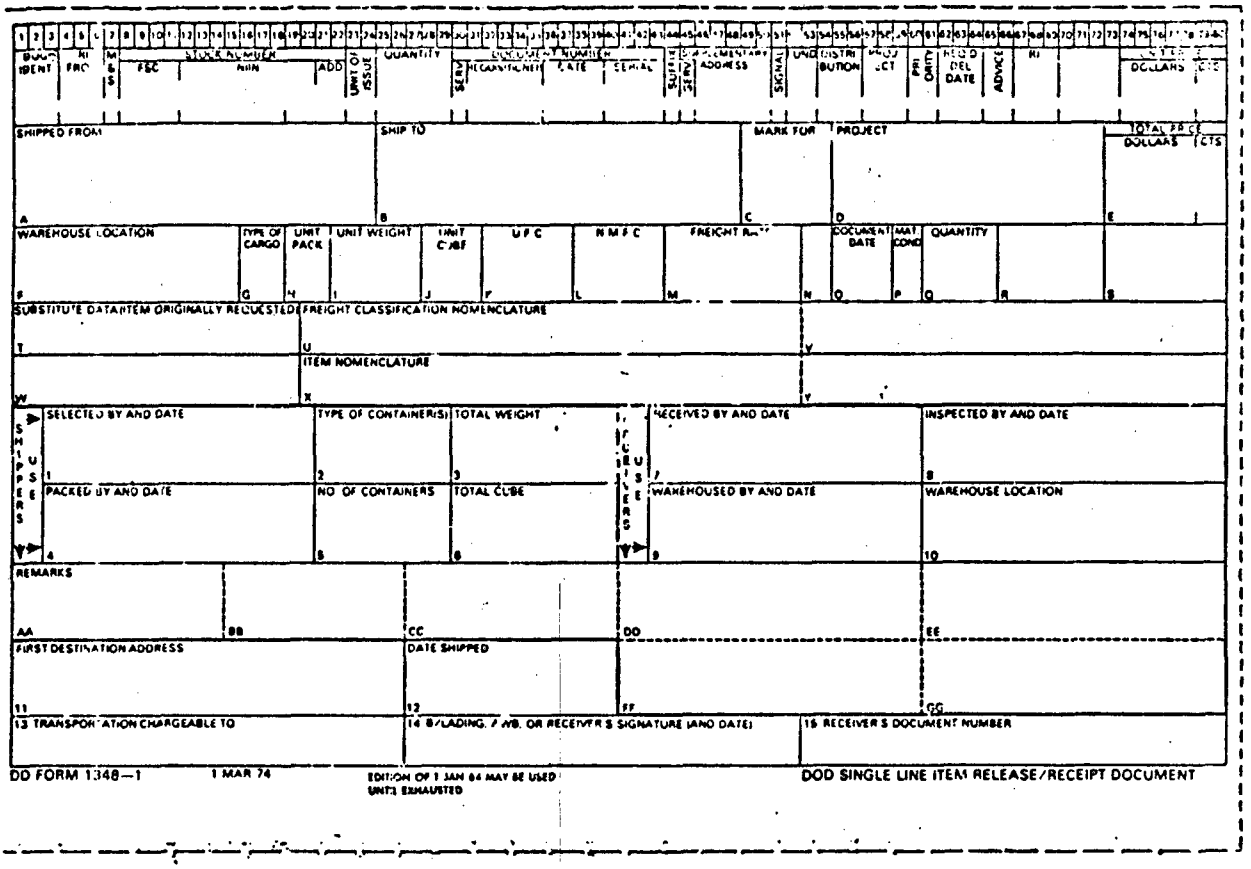
8-22 NSN or FSCM/Drawing No (encl 11)
23-24 Unit of issue EA or LB
25-29 Quantity
30-43 Storage Location Assign Document No.
44 Blank
45-51 Blank
52-66 Blank
67-69 Routing Identifier Code Storing Materiel
70 A
71 Condition Code of Materiel
72-80 Blank



CC 1- 3 A5E
4- 6 Routing Identifier of Shipper
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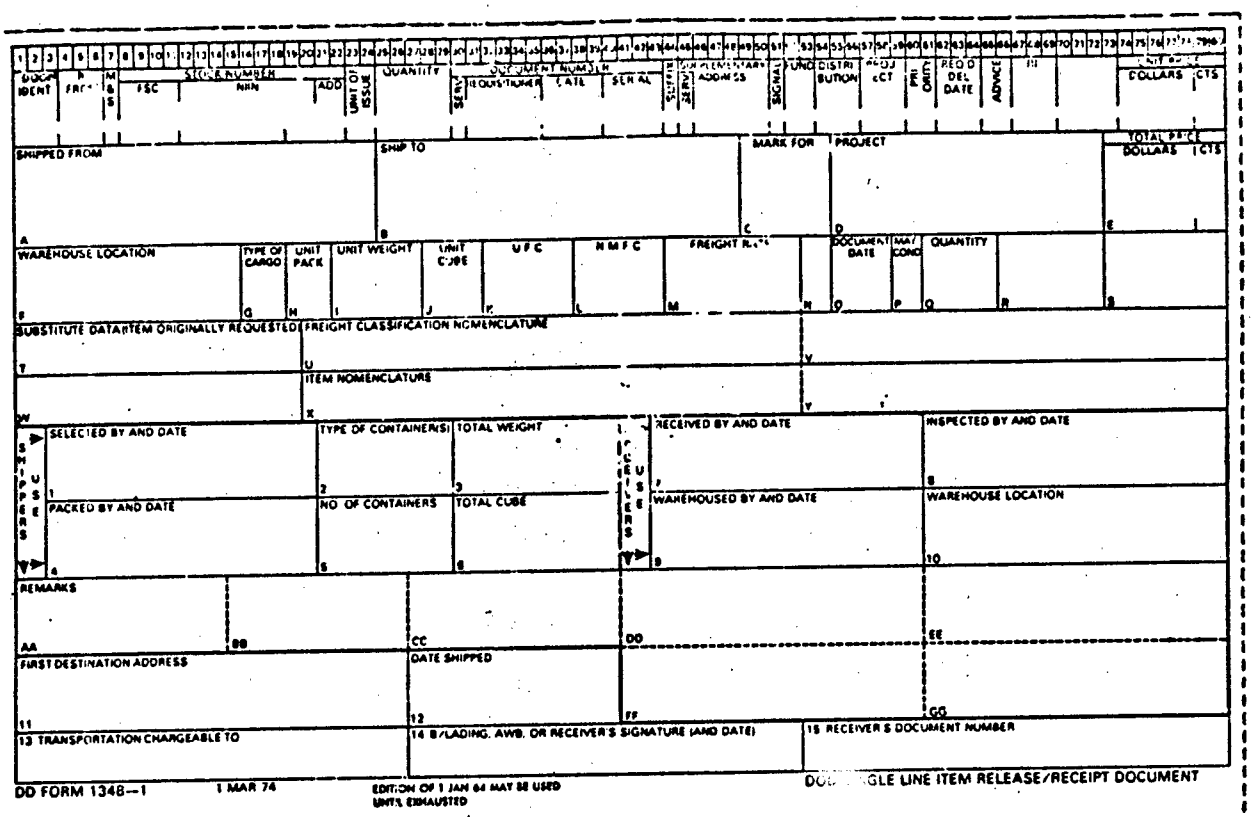
8-22 NSN or FSCM/Drawing No (encl 11)
23-24 Unit of Issue. EA lb, ML
25-29 Quantity
30-43 Shipper Assigns Document No
44 Blank
45-50 Y00000 Use In The Clear Address (encl 9)
51 M
52-53 GA
54-59 Blank
60-61 15
62-64 Required Delivery Date Shipper Assign
65-80 Blank



CC 1- 3 D6J
4- 6 Routing Identifier Code to whom the card is being sent
7 Blank
8-22 NSN or FSCM/Drawing No (encl 11)
23-24 Unit of Issue EA or LB
25-29 Quantity
30-43 Document No. (Locally Assigned)
44 Blank
45-66 Blank
67-69 Routing Identified Code of Depot Reporting Receipt
70 A
71 Condition Code of Materiel
72-80 Blank

INSTRUCTIONS DA FORM 4508
FIGURE 1 ATTACHED

Controls the movement of ammunition within an installation and accomplishes serial or lot number, stock number, and item data changes and reclassification actions. When used for assembly or disassembly type operations, where more than one stock number will result in one stock number or one stock number will result in several stock numbers, the stock numbers and nomenclatures of the several items may be entered in the serial or lot number column of the (From) or (To) side, as applicable. In these cases, the stock number and nomenclature blocks of the applicable side will be annotated "see below."

Block title	Instructions
DATE PREPARED	Enter date document is prepared (day, month, year).
CONTROL NUMBER	Enter locally assigned control number.
STOCK NUMBER	Enter national stock number assigned to item.
NOMENCLATURE	Enter nomenclature of item.
SERIAL/LOT NUMBER	Enter assigned serial/lot number.
COND	Enter condition code assigned to item.
SITE LOCATION	Enter site location.
GRID LOCATION	Enter grid location.
RES SITE	Enter reservation site code, if applicable.
T/S	Enter type space code which indicates type of space occupied by materiel.
L/C	Enter locally assigned location control code.
METH	Enter method of storage code which indicates method used to store materiel.
MGR	Enter routing identifier code of ammunition manager.
QUANTITY	Enter total quantity of lot.
NO. PKG.	Enter total number of exterior packages or containers.
UP QTY	Enter unit pack quantity.
REMARKS	Enter any additional guidance deemed necessary.
TYPE OF ACTION	Check (✓) required type of transaction.
SIGNATURE OF FOREMAN/ CHECKER INSPECTOR	Obtain signature of crew foreman, checker, or inspector.

Block title	Instructions
DATE OF ACTION	Enter date item was relocated.
APPROVED DATE	Obtain authenticating signature and date.
APPROVED DATE	Obtain signature and date of chief of surveillance or of authorized representative. (Required for condition code changes.)
FROM	Enter above data applicable to item prior to accomplishing required transaction.
TO	Enter above data applicable to item after transaction is completed.

AMMUNITION TRANSFER RECORD

(AMCR 740-25)

DATE PREPARED | CONTROL NUMBER

FROM

STOCK NUMBER	NOMENCLATURE

TO

STOCK NUMBER	NOMENCLATURE

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/C	T/C	TERM	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/C	T/C	TERM	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											

REMARKS

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR | DATE OF ACTION

APPROVED/DATE

APPROVED/DATE

DA FORM 1 MAY 79 4508

1970-288-144

FIGURE 1

SHIPPING ADDRESSES

FUZE:
IGNITERS & SQUIB
M34/M36 BURSTERS

COMMANDER
ARMAMENT RESEARCH & DEVELOPMENT CENTER
ATTN: SMCAR-LCN (MR. ROBINSON)
DOVER, NJ 07801-5001

WARHEAD:
MOTOR:

COMMANDER
TOOELE ARMY DEPOT
ATTN: M55 RKT ASSESSMENT (J. PRINCIPE)
TOOELE, UT 84074-5013

PROPELLANT:

COMMANDER
ARMAMENT RESEARCH & DEVELOPMENT CENTER
ATTN: SMCAR-LCE (DR. RICHTER)
DOVER, NJ 07801-5001

METAL PARTS
& SHIPPING
&FIRING TUBE:

COMMANDER
AMMRC
ATTN: AMXMR-MMS (F. CHANG)
WATERTOWN, MA 02172-0001

AGENT: WILL BE PACKED AND MARKED BY TECHNICAL PERSONNEL FROM CRDC (RDT & E Shipments Requirements Apply)

Agent:
ANAD TO
LBDA
10ML SAMPLES

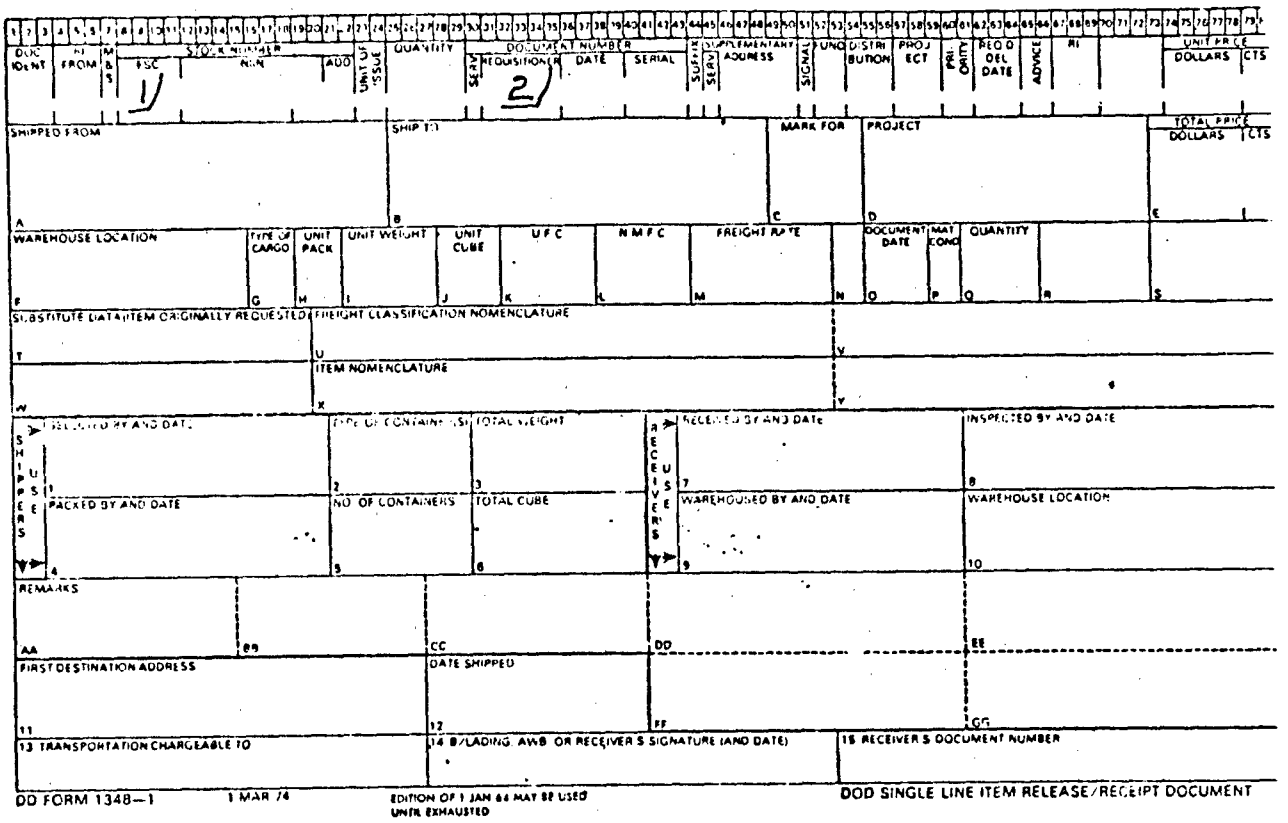
COMMANDER
PINE BLUFF ARSENAL
ATTN: SMCPB-MMC (M55 ROCKET ASSESSMENT)
PINE BLUFF, AR 71602-9500

TEAD TO
UMDA
10ML SAMPLES

COMMANDER
DUGWAY, PROVING GROUNDS
ATTN: STEDP-MT-C
SALT LAKE CITY, UT

TEAD TO
UMDA
600ML

CDR
CHEMICAL RESEARCH, and DEVELOPMENT CENTER
US ARMY ARMAMENT MUNITIONS and CHEMICAL COMMAND
ATTN: SMCCR-MU (A)
ABERDEEN, MD 21010-5423



This form will be filled out in accordance with instructions contained in AR 725-50

Two extra copies will be completed and processed as follows.

One copy will be mailed to this HQ, ATTN: AMSMC-DSD-AS at the time shipment is made

One copy will accompany shipment and the recipient will acknowledge receipt of the materiel indicated thereon by indicating on the reverse thereof

Date received

Name of recipient printed (typed) and signed

This copy will be mailed to this HQ, ATTN: AMSMC-DSD-AS within two working days of the receipt

1/ Utilize NSN or FSCM/Drawing Number listed on enclosure 2

2/ Assign local document number

Enclosure 10to Appendix K

NSN or DRAWING NUMBER	REV	NOMENCLATURE
1340-00-724-3567	K	Rocket, Chemical Agent, 115mm, M55 VX
1340-00-716-1450	K	Rocket, Chemical Agent, 115mm, M55 GB
8136190-1-11	D	Anti-resonance Assembly
8136190-1-12	G	Warhead, Rocket, Chemical M56 Assembly w/o Fuze & Burster GB
8136190-1-13	H	Rocket, Chemical M55 Packing & Marking Assembly
8136190-1-14	G	Name Plate & Identification Band
8136190-1-21	B	Rocket, Practice, Simulant EG, M61
8136190-2-63VX	K	Warhead, Rocket, Chemical, M56 VX
8136190-2-63GB	K	Warhead, Rocket, Chemical, M56 GB
8136190-2-67	G	Adapter
8136190-3-47	H	Rocket Motor Assembly, M67
8136190-3-51	D	Rocket Motor Spacer, Sealing
8136190-3-52	H	Fin, Rocket Motor, M150 Assembly
8136190-3-59	G	Rocket Motor Fin
8136190-3-61	D	Rocket Motor Igniter
8136190-3-63	F	Rocket Motor Propelling Grain, M28
8136190-3-66	G	Rocket Motor Cap, Nozzle
8136190-3-67	H	Rocket Motor Body
8136190-3-70	F	Rocket Motor Plate Nozzle Assembly
8136190-3-76	D	Rocket Motor Closure
8136190-4-26	G	Fuze Rocket PD M416 Assembly
8136190-4-27	D	Rocket Fuze Body Assembly
8136190-4-28	D	Rocket Fuze Body

NSN or DRAWING NUMBER	REV	NOMENCLATURE
8136190-4-29	D	Rocket Fuze Anvil
8136190-4-30	C	Rocket Fuze Cover, Nose
8136190-4-31	B	Rocket Fuze Ring Retaining
8136190-4-32	D	Rocket Fuze Pin, Firing
8136190-4-33	E	Rocket Fuze Booster Assembly
8136190-4-34	C	Rocket Fuze Cup, Booster
8136190-4-35	C	Rocket Fuze Disk, Booster
8136190-4-36	D	Rocket Fuze Pellet Booster
8136190-4-38	B	Rocket Fuze Cup Booster Lead
8136190-4-39	B	Rocket Fuze Rotor and Housing Assembly
8136190-4-53	D	Rocket Fuze Rotor
8136190-4-83	D	Rocket Fuze Rotor, Loaded Assembly
8136190-4-84	A	Rocket Fuze Cushion Detonator
8136190-4-85	D	Rocket Fuze Rotor, Lead, Assembly & Detail
8136190-4-95	A	Rocket Fuze Washer
8136190-4-201		Rocket Fuz Washer Packing
8136190-6-62(LM)	E	Packing, Rocket, M55/M60/M61
8136190-6-62	G	Packing, Rocket, M55/M60/M61
8136190-6-63	B4	Pallet Saddle, Top End
8136190-6-64	B4	Pallet Saddle, Top Center
8136190-6-65	B4	Pallet Saddle, Intermediate
8136190-6-66	B5	Pallet Saddle, Bottom
8136190-6-67	C4	Pallet Stringer

NSN or DRAWING NUMBER	REV	NOMENCLATURE
8136190-6-68	C	Pallet End
8136190-6-69	C	Pallet Skid
8136190-6-81	D	Container, Shipping & Firing M441
8136190-6-82	D	Container, Rear Cap
8136190-6-83	D	Container, Front Cap
8136190-6-84	C	Container, Cushion, Fuze
8136190-6-85 (1 of 2)	E	Container Packing Tube Type I
8136190-6-85 (2 of 2)		Container Packing Tube Type II
8136190-6-86	B	Reciprocal, Electrical
8136190-8-6	E	Burster, Rocket, M34
8136190-8-7	B	Tube, Burster, M34
8136190-8-8	D	Tube, Burster, M36
8136190-8-9	E	Tube, Burster, Rocket, M36
192038798730	D	Detonator, Stab, M63

The drawing numbers listed above will be modified with a suffix(s) when applicable.

Suffix Codes:

S = Sectionalized
MP = Metal Parts Inert
CC
1X
3X
5X
Levels of Contamination
See para H-3a DMWR 9-1340-H520X20
Attached as encl to Annex B Basic Plan

ITEM NOMENCLATURE	NET QUANTITY PER PACKAGE	TRANSPORTATION CONTROL NO
	CONSIGNMENT GROSS WEIGHT	DESTINATION

SUPPLEMENTAL INFORMATION	LOAD STORAGE/GROUP
	FLASH POINT

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Dept of Transportation. THIS IS A MILITARY SHIPMENT! *(Complete applicable blocks below)*

	This shipment is within the limitations prescribed for PASSENGER AIRCRAFT/CARGO AIRCRAFT ONLY (Delete nonapplicable aircraft)		ATA IATA/IMCO REGULATIONS	
	AFR 71-4, TM 38-250, NAVSUPPUB 505, MCO P4030.19, DLAM 4145.3, Paragraph _____	49 cfr	PARAGRAPH	EXEMPTION
	DOD 4500.32R (MILSTAMP)		173.7 (a)	DOT-E 7573

ADDRESS OF SHIPPER	TYPED NAME, SIGNATURE AND DATE

DD FORM 82 FEB 1387-2 EDITION OF MAY 79 IS OBSOLETE. **SPECIAL HANDLING DATA/CERTIFICATION**

Sample

Enclosure 12 to Appendix K

MOTOR VEHICLE INSPECTION
(TRANSPORTING HAZARDOUS MATERIAL)

GBL. NO.	ORIGIN	DESTINATION
NAME OF CARRIER		
NAME OF DRIVER		
DATE AND HOUR		
INSTALLATION/ACTIVITY		
DRIVER'S STATE PERMIT NO.		
MEDICAL EXAMINER'S CERTIFICATE AND DATE		

VEHICLE

TYPE OF VEHICLE	TRUCK NUMBER	TRAILER(S) NUMBER	SLEEPER CAB
☐ TRUCK ☐ TRUCK AND FULL TRAILER ☐ TRACTOR AND DOUBLE TRAILERS ☐ TRACTOR AND CLOSED SEMI-TRAILER ☐ TRACTOR AND FLAT-BED TRAILER	ORIGIN DESTINATION	ORIGIN DESTINATION	☐ YES ☐ NO VALID LEASE ☐ YES ☐ NO I.C.C. NUMBER

NOTE: All of the following items shall be checked on empty equipment prior to loading. Items with an asterisk(*) shall be checked on incoming loaded equipment.

ITEM NO.	CHECK APPROPRIATE COLUMN *(See reverse side for explanatory notes)*	ORIGIN SAT	ORIGIN UNSAT	DESTINATION SAT	DESTINATION UNSAT	REMARKS *(Explain unsatisfactory items; use reverse side if necessary)*
1.	ENGINE, BODY, CAB AND CHASSIS CLEAN					
2.	STEERING MECHANISM					
3.	HORN OPERATIVE					
4.	WINDSHIELD AND WIPERS					
5.	SPARE ELECTRIC FUSES AVAILABLE					
6.	REAR VIEW MIRRORS INSTALLED					
7.	HIGHWAY WARNING EQUIPMENT					
* 8.	FULL FIRE EXTINGUISHER INSTALLED					
9.	LIGHTS AND REFLECTORS OPERATIVE					
10.	EXHAUST SYSTEM					
* 11.	LIQUID PETROLEUM GAS POWERED VEHICLES					
* 12.	FUEL TANK, LINE AND INLET					
13.	COUPLING DEVICES - KINGPIN LOCK					
* 14.	ALL BRAKES OPERATIVE					
* 15.	LANDING GEAR ASSEMBLY OPERATIVE					
16.	SPRINGS AND ASSOCIATED PARTS					
* 17.	TIRES					
18.	CARGO SPACE					
* 19.	ELECTRIC WIRING					
* 20.	TAIL GATE AND DOORS SECURED					
* 21.	FIRE AND WATER RESISTANT TARPAULIN					
22.	ANY OTHER DEFECTS *(Specify)*					

SAMPLE

☐ APPROVED
☐ REJECTED
(If rejected give reasons on reverse under "Remarks". Equipment shall be approved if deficiencies are corrected prior to loading.)

SIGNATURE *(of Inspector)* ORIGIN

SIGNATURE *(of Inspector)* DESTINATION

	ITEMS TO BE CHECKED PRIOR TO RELEASE OF LOADED VEHICLE	ORIGIN	DESTINATION
23.	MIXTURES OF MATERIAL PROHIBITED BY DOT REGS. ARE NOT LOADED ONTO THIS VEHICLE		
* 24.	LOAD IS SECURED TO PREVENT MOVEMENT		
25.	WEIGHT IS PROPERLY DISTRIBUTED AND VEHICLE IS NOT OVERWEIGHT		
* 26.	SEALS(S) APPLIED TO CLOSED VEHICLE, FIRE AND WATER RESISTANT TARPAULIN APPLIED ON OPEN VEHICLE		
* 27.	SPECIAL INSTRUCTIONS *(DD Form 836)* FURNISHED DRIVER		
* 28.	COPY OF VEHICLE INSPECTION *(DD Form 626)* FURNISHED DRIVER		
* 29.	PROPER PLACARDS APPLIED		
* 30.	SHIPMENT MADE UNDER DOT EXCEPTION 8PS		

SIGNATURE *(of Inspector)* ORIGIN	SIGNATURE *(of Driver)* ORIGIN
Enclosure 13 to Appendix K	
SIGNATURE *(of Inspector)* DESTINATION	SIGNATURE *(of Driver)* DESTINATION

DD FORM 1 APR 78 626

REPLACES EDITION OF 1 JUN 72, WHICH IS OBSOLETE.

MATERIEL COURIER RECEIPT

SHIPPER	SHIPPER'S CONTROL/DOCUMENT NO.
	SUPPLY ACCOUNT NUMBER
DESTINATION	SUPPLY ACCOUNT NUMBER

I certify by my signature that I have received the material listed on this form and am aware of the applicable safety and security requirements.

SHIPMENT TRANSFERS

FIRST	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT'S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
SECOND	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT'S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
THIRD	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT'S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
FOURTH	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT'S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
FIFTH	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT'S PRINTED NAME (LAST, FIRST, M.I.) Enclosure 14 to Appendix K		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER

PRIVACY ACT STATEMENT

AUTHORITY 5 U.S.C., Sec 552a (PL 93-579)
PRINCIPLE PURPOSES: To provide a receipt for transfer of controlled material. The use of the SSAN is required and is necessary to provide positive identification of the individuals receipting for the materiel.
ROUTINE USES: To document transfer of material from a shipper to a courier, courier to courier and/or receiver.
DISCLOSURE IS VOLUNTARY: Since the SSAN must be used, refusal to provide SSAN may be grounds for action to remove the individual concerned from duties involving the materiel transferred by use of this form.

SHIPMENT DESCRIPTION

LINE NUMBER	QUANTITY	SERIAL NUMBERS	REMARKS

Sample

DD FORM 1911, 82 MAY

PREVIOUS EDITION MAY BE USED UNTIL 31 DEC 82.

RECAPITULATION OF TRANSACTIONS

1. Figure 1. Displays the impact on the accountable records (B14) and the custodial records at each location as a result of M55 rocket assessment. Should the four leaker rounds at UMDA be included in the assessment the values indicated will oe amended accordingly.

2. Figure 2. Displays the actions required at each of the six locations involved.

3. Figure 3. Displays action required at test facilities upon completion of their post of the assessment action.

AMCCOM
ACCOUNTABLE RECORDS

	ANAD	JICA	LBDA	PBA	UMDA	TEAD	TOTAL
ROCKETS (LOSS)	54	42	40	104	62	90	392
WARHEADS (GAIN)	38	42	32	104	38	44	298
B/A GB (GAIN) lbs[1]	171	-	86	-	257[2]	492	1006½[1]

[1] ROUNDED TO NEAREST POUND - DISCOUNTS WEIGHT OF SAMPLES BASED ON 10.7 LBS PER WHD

[2] DOES NOT INCLUDE AGENT FROM FOUR LEAKER ROUNDS AT UMDA.

FIGURE 1

Depot Shipments

	ANAD	JICA	LBDA	PBA	TEAD	UMDA
AGENT 10ML	32 TO PBA	-	16 TO PBA	-	92 TO DPG	56 TO DPG
AGENT 600ML	-	-	-	-	5 TO CRDC	5 TO CRDC
AGENT lbs[1/]	171	-	86	-	492	257[2/]
WARHEAD LESS GB	16 TO TEAD	-	8 TO TEAD	-	46 TO DISASSY	24 TO TEAD
WARHEAD WITH GB/VX[1/]	38	42	32	104	44	38
MOTOR	54 TO TEAD	42 TO TEAD	40 TO TEAD	104 TO TEAD	90 TO DISASSY	62 TO TEAD
PROPELLANT SAMPLES					1.176 TO ARDC SAMPLES	
PROPELLANT RESIDUE					TO 11P ACCOUNT RESIDUE	
METAL PARTS WHD					20-35 TO AMMRC* SAMPLES	
METAL PARTS WHD					TO 11P ACCOUNT RESIDUE	
SHIPPING AND FIRING TUBE					20-35 TO AMMRC* SAMPLES	
SHIPPING AND FIRING TUBE					TO 11P ACCOUNT RESIDUE	
FUZES					94 TO ARDC	
BURSTER M34					94 TO ARDC	
BURSTER M36					94 TO ARDC	
IGNITER & SQUIB					392 TO ARDC	

*QTY BASED ON EXAMINATION BY LAB PERSONNEL. 1/ RETURN TO CUSTODIAL/ACCOUNTABLE RECORDS (B14)

2/ DOES NOT INCLUDE AGENT FROM FOUR LEAKER ROUNDS AT UMDA

FIGURE 2

TESTING AGENCIES
(TESTING COMPLETE)

	PBA	DPG	CRDC	ARDC	AMMRC
AGENT GB	480 ML	1480 ML	6000 ML		

PBA AND CRDC TRANSFER TO TON CONTAINERS REPORT TO CUSTODIAL/ACCOUNTABLE RECORDS

DPG RETAIN IN R & D ACCOUNT.

METAL PARTS WARHEAD		20-35 TO DPDO
SHIPPING AND FIRING TUBE		20-35 TO DPDO
PROPELLANT SAMPLES	1.176	INERT MATERIEL TO DPDO
FUZES	94	
BURSTERS M34	94	EXPLOSIVE RESIDUE SEND TO LETTER KENNY ARMY
BURSTERS M36	94	DEPOT M/F 11P ACCOUNT W25R1R
IGNITER & SQUIB	392	

FIGURE 3

APPENDIX L

M55 GB/VX ROCKET ASSESSMENT

PUBLIC AFFAIRS

APPENDIX L
PUBLIC AFFAIRS PLAN

SUBJECT: M55 GB Rocket Stockpile Assessment Public Affairs Plan

1. Reference:

a. M55 Rocket (H520) Stockpile Assessment Plan, 21 Sep 84 and Change 1, dated 5 Oct 84.

b. Installation CAIC plans.

2. Situation: The M55 rockets were declared obsolete and unserviceable in 1982. Three disposition options have been identified: (1) continued storage; (2) on-site destruction; (3) transportation to a designated site or sites for destruction. These items have presented challenges for the Army in view of the potential hazards posed during storage, movement, or disposal. Before a determination can be reached as to the best course of action, more detailed information about the current and projected condition of the rockets is needed. In this regard, an extensive assessment is scheduled to begin in Jan 1985 to characterize the rockets. The data collected from this assessment will enhance safety and provide better information concerning deterioration characteristics, the projected safe storage life of the rockets and the feasibility of safely transporting the rockets to another location.

3. Purpose: This plan delineates the concepts, objectives, policy and responsibilities for the conduct of public affairs activities associated with the assessment of the M55 rocket stockpile.

4. Concept:

a. Throughout the assessment, an active public affairs plan will be conducted to keep the public and state and local leaders aware of all operations and that all operations are environmentally safe.

b. The basic public affairs principle is openness and candor compatible with safety and security.

5. Objectives:

a. To inform the public and appropriate officials of the Army's plans to conduct the assessment.

b. To assure the public that safety of personnel and the environment are paramount considerations in the planning and conduct of the assessment.

c. To make full public disclosure of all findings resulting from the assessment during the National Environmental Protection Act scoping assessment and documentation process.

6. Policy: All information in the plan may be released by affected installations. Questions beyond the scope of this plan will be referred through public affairs channels to HQ AMC (AMCPA and AMCCN) which serve as the single point of contact for release of information for all actions associated with the M55 rocket disposal program.

a. In the event of a chemical accident/incident or occurrence during the planned assessment operations, public affairs actions will follow established installation CAIC plans and procedures.

b. No commitments will be made to the public or news media to observe the actual assessment operations without approval through command channels.

7. Implementation: This plan will be implemented upon direction from HQ, AMC (AMCCN).

8. Responsibilities:

a. Office, Chief of Public Affairs, Department of the Army (SAPA) will:

(1) Expedite approval of this plan.

(2) Notify OASD (PA): (a) when announcement is made at beginning of assessment operations; (b) in the event of chemical accident/incident; (c) when assessment operations have been completed; and (d) upon release of assessment findings.

b. Office, Chief of Legislative Liaison (SALL) will make appropriate Congressional notifications.

c. Public Affairs Office, US Army Materiel Command (AMCPA) will:

(1) In coordination with AMCCN, exercise overall operational responsibility for execution of the public affairs plan.

(2) Expedite approval and clearance requirements with SAPA.

(3) Notify SAPA: (a) when announcement is made at beginning of assessment operations; (b) in the event of chemical accident/incident; (c) when assessment operations have been completed; and (4) upon release of assessment findings.

(4) Provide additional guidance and assistance in support of this plan to subordinate commands as required.

(5) Respond to media queries which cannot be answered at the installation level within the purview of the information provided in this plan.

e. Commander, US Army Armament, Munitions and Chemical Command will:

(1) Coordinate policy, guidance and clearance requirements, as required.

(2) Respond to media queries as required; provide news clippings and brief synopsis of coverage to AMCPA.

(3) Provide additional guidance and assistance to affected installations in support of this plan, to include approved changes to the assessment procedures and schedule.

(4) Provide CDR WESTCOM required technical support and assistance IAW current MOU and the overall assessment plan.

f. Commander, US Army Depot System Command will:

(1) Exercise operational responsibility for execution of this plan at all affected DESCOM installations.

(2) Respond to media queries, as required; provide news clippings and brief synopsis of media coverage to AMCPA.

(3) Provide additional guidance and assistance to its installations in support of this plan, to include approved changes to assessment procedures and schedule.

g. Commander, US Army Western Command will:

(1) Exercise operational responsibility for execution of this plan at Johnston Island.

(2) Respond to media queries regarding JI aspect of the assessment, as required; provide news clippings and a brief synopsis of media coverage to AMCPA.

(3) Refer all queries regarding the assessment that involve other than JI operations to HQ, AMC (AMCPA).

h. Commanders of affected installations will:

(1) Notify state governors and other local officials, as authorized.

(2) Insure that their higher headquarters are kept informed of all local responses to inquiries.

(3) Release all required approved announcements to local media.

(4) Respond to local local queries using appropriate material in Annexes to this plan.

(5) Refer all queries not involving their installations' operations to higher headquarters.

(6) Submit after-action report, including copies of all local news and photo releases, responses to significant queries, copies of local press clippings and an evaluation of local media and public reaction to assessment operation through command channels to AMC within 30 days following completion of operations.

9. Annexes:

A - Public Affairs Milestones.

B - Initial News Release.

C - Questions and Answers.

D - Assessment Results.

10. Upon approval, copies of this plan will be distributed to:

COMMANDERS
US Army Materiel Command Field Safety Agency, ATTN: AMXOS/AMXOS-C, Charlestown, IN 47111-9669
US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-DSM-C, Rock Island IL 61299
US Army Depot System Command, ATTN: AMSDS-QV/AMSDS-T/AMSDS-SM-SPA, Chambersburg, PA 17201
Armament Research and Development Center, US Army Armament, Munitions, and Chemical Command, ATTN: SMCAR-SF; SMCAR-LCE-C/Dr. Matsuguma, SMCAR-LCN-M/Mr. Chevalaz, Dover, NJ 07801
Chemical Research and Development Center, US Army Armament, Munitions and Chemical Command, ATTN: SMCCR-CLG-BE/SMCCR-MU/SMCCR-SPS-MA/SMCCR-SF/ SMCCR-CO, Aberdeen Proving Ground, MD 21010
US Army Materiel and Mechanics Research Center, ATTN: AMXMR-MMS, Arsenal Street, Watertown, MA 02171-0001
US Army Toxic and Hazardous Materials Agency, ATTN: AMXTH-ES/AMXTH-SE/ Major Cortez
US Army Western Command, ATTN: APOP-NC, Fort Shafter, HI 96858
Johnston Island Chemical Activity, ATTN: AMSMC-CH, Johnston Atoll
Pine Bluff Arsenal, ATTN: AMCPB-CO, Pine Bluff, AR 71601
Anniston Army Depot, ATTN: SDSAN-CO, Anniston, AL 36201
Tooele Army Depot, ATTN: SDSTE-COP, Tooele, UT 84074
Lexington-Blue Grass Army Depot Activity, ATTN: SDSAN-CO, Lexington, KY 40511
Umatilla Army Depot Activity, ATTN: SDSTE-UM-CO, Hermiston, OR 97838
AMC Surety Field Activity, Dover, NJ 07801

CHAIRMAN

Department of Defense Explosive Safety Board, ATTN: DDESB-KA, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600

DIRECTORS

US Army Defense Ammunition Center and School, ATTN: SMCAC-AV/SMCAC-ASN/ SMCAC-DEN

US Army Management Systems Support Agency, ATTN: AMXSY-RW

AMC Field Safety Activity, Charlestown, IN 47111

Defense Nuclear Agency, Washington, DC 20305

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA. 22333

18 JAN 1985

AMCPA-MR

SUBJECT: M55 Rocket Special Stockpile Assessment Public Affairs Plan

SEE DISTRIBUTION

1. The attached approved Public Affairs Plan for the M55 Special Stockpile Rocket Assessment Program is forwarded for implementatio .

2. The Information for Members of Congress drop will be made at 1530 hours Eastern Standard Time, 22 January 1985. Installation PAO's may make their public announcements and local news releases one hour later using their respective local time. POC for any questions regarding this plan is Arthur V. Whitney, AUTOVON 284-8012.

FOR THE COMMANDER:

Enclosures

D. J. O'MALLEY
Colonel, GS
Chief of Public Affairs

DISTRIBUTION:

COMMANDERS
ARDC, ATTN: SMCAR-IN
AMCCOM, ATTN: AMSMC-IN
CRDC, ATTN: SMCCR-IN
DESCOM, ATTN: AMSDS-PAO
AMRAC, ATTN: DRXMR-J
USATHAMA, ATTN: AMXTH-ES
US Army Western Command
Johnston Island Chemical Activity
Pine Bluff Arsenal, ATTN: SMCPB-IN
Anniston Army Depot, ATTN: SDSAN-DAS-PA
Tooele Army Depot, ATTN: SDSTE-PAO
Lexington Blue Grass Depot Activity,
ATTN: SDSAN-L.P
Umatilla Army Depot Activity, ATTN: SDSTE-UA
AMC Surety Field Activity

RCVD - 23 JAN 1985

ANNEX A TO APPENDIX L (MILESTONES)

DATE	ACTION	
17 Oct 1984	Develop Plan	AMCCOM/DE[illegible].M/WESTCOM
10 Dec 1984	AMC Approval of Plan	AMC
20 Dec 1984	Submission to DA and Approval	AMC DA
22 Jan 1985	Formal Congressional Drop and Installation Media Release	SALL/Installation Commanders
TBD	Media Releases as Results Emerge	AMC/AMCCOM

DEPARTMENT OF THE ARMY
Office of the Secretary of the Army
Washington, D.C. 20310

INFORMATION FOR MEMBERS OF CONGRESS

The Army Announces Plans to Conduct a Special M55 Rocket Assessment Program

The Department of the Army announced today that a Finding of No Significant Impact will be published in the Federal Register on January 23, 1985 in preparation for conducting a phased assessment of the stockpile, which will provide an indication of the current and projected condition of the 476,895 M55 rockets. Statistical data obtained from the assessment will be used in conjunction with the environmental documentation to support the decision regarding the final disposition of the rocket stockpile.

Based on the results and analyses derived from the assessment and the Environmental Impact Statement (EIS), the Army will decide upon one of three options being considered regarding the future of the M55 rocket stockpile. They are: continued storage of the rockets at their present locations; transport to one or more central sites for disposal (collocation); and disposal at each storage site after construction of demilitarization facilities.

The M55 chemical rocket stockpile is located at the following six Army installations: Tooele Army Depot, Utah; Umatilla Depot Activity, Oregon; Pine Bluff Arsenal, Arkansas; Lexington-Blue Grass Depot Activity, Kentucky; Anniston Army Depot, Alabama, and Johnston Island in the Pacific.

In order to conduct the assessment, a series of closely controlled tests will be made on random lots of rockets from these installations. Each rocket component, i.e., motor, fuze, burster, propellant, igniter, chemical agent filler, metal casing, and shipping container will be scientifically analyzed to determine its condition.

Test equipment and facilities are not available at each storage location to allow for testing operations on site, therefore, some rocket items will be transported to other Army test facilities for examination and study.

Research quantities of chemical agent samples and drained warheads will be shipped by Army aircraft, accompanied by specially trained Army personnel from the U. S. Army Technical Escort Unit, Aberdeen Proving Ground, Maryland. Each of these shipments will be packaged under the strictest safety measures in accordance with the Department of Transportation and Department of Defense shipping regulations. All other components will be free of agent and transported by commercial Department of Transportation licensed carriers.

The Chemical Research and Development Center, Aberdeen Proving Ground, Maryland; Pine Bluff Arsenal, Arkansas; Tooele Army Depot, and the Dugway Proving Ground, both in Utah, will receive the chemical agent samples for analysis. Metal parts will be shipped to the U. S. Army Material and Mechanical Research Center, Watertown, Massachusetts, for metallurgical studies, while explosive components will be analyzed at the Army's Large Caliber Laboratories located in Dover, New Jersey.

Throughout the entire assessment program, specially trained Army and civilian personnel will administer the operations. Safety and Environmental considerations will be paramount during all phases of the assessment.

Army officials expect the project to cost approximately three and one-half million dollars. All information obtained from the assessment will be included in the Draft Environmental Impact Statement which will be made available to the public.

FURNISHED BY:
OFFICE, CHIEF OF
LEGISLATIVE LIAISON

Billing Code: 3710-08-M

DEPARTMENT OF DEFENSE

FINDING OF NO SIGNIFICANT IMPACT

AGENCY: Department of the Army, Department of Defense

ACTION: Finding of No Significant Impact (FNSI) for the M55 Rocket Stockpile Assessment Plan. A comprehensive Environmental Assessment (EA) has been prepared which discusses the sampling operation to be used for characterizing the condition of the rocket components (agent, propellant, metal, explosive burster, and fuze) through a programed composite of laboratory analyses. The test data derived from the analyses will be utilized to formulate important decisions regarding the ultimate disposition of the M55 rocket stockpile.

Sample collection will be conducted at six locations: Umatilla Depot Activity, Hermiston, Oregon; Tooele Army Depot, Tooele, Utah; Lexington-Blue Grass Depot Activity, Lexington, Kentucky; Pine Bluff Arsenal, Pine Bluff, Arkansas; Anniston Army Depot, Anniston, Alabama; and Johnston Island in the Central Pacific.

The assessment plan consists of several steps. First, the rocket motor, which contains no agent, will be removed from the warhead and shipped to Tooele Army Depot for further disassembly and analysis. Next, the chemical agent will be drained from the munitions into specially configured containers and placed in storage on site. Then, the agent and propellant samples and remaining rocket components will be shipped to several specialized analytical laboratories. Finally, all samples and components will be analyzed.

Shipments of the samples and components will be in full conformance with all applicable regulations (i.e., Federal, State, Army). The agent samples will be transported in specially designed containers via military air accompanied by US Army Technical Escort Unit personnel.

The proposed plan was selected after extensive study of several other options. Initially, the decision was made to conduct the rocket assessment instead of continuing the status quo of normal stockpile monitoring and surveillance procedures. Then, the proposed plan was selected over two other options: (a) transporting the rockets to one location for disassembly, sampling and analysis; and (b) draining the rocket warheads prior to disassembly. The proposed plan appears to be optimum based on comparisons of safety, effectiveness, process simplicity, environmental impact and cost.

The Finding of No Significant Impact was established after consolidating site specific environmental assessments developed for each of the six sites. Because of safeguards built into the operation and contingency plans which have been developed for the extremely remote possibility of agent release and rocket detonation, no adverse environmental impact is associated with the M55 rocket assessment. Accordingly, an Environmental Impact Statement (EIS) is not required.

The complete Environmental Assessment, which includes all participating installations, is incorporated by reference and copies may be obtained from the Commander, Armament, Munitions and Chemical Command, ATTN: AMSMC-DS (M55 Functional Task Group), Rock Island, Illinois 61299.

Copies of the specific environmental documentation for each storage site may be obtained from the following locations:

Commander, Anniston Army Depot
ATTN: SDSAN-DAS-FE
Anniston, Alabama 26201

Commander, Lexington-Blue Grass Depot Activity
ATTN: SDSAN-LAF
Lexington, Kentucky 40507

Commander, Pine Bluff Arsenal
ATTN: SMCPB-EM
Pine Bluff, Arkansas 71601

Commander, Tooele Army Depot
ATTN: SDSTE-ASF-E
Tooele, Utah 84074

Commander, Umatilla Depot Activity
ATTN: SDSTE-UA-CO
Hermiston, Oregon 97838

Commander, WESTCOM
ATTN: APEN-ISF
Fort Shafter, Hawaii 96858

Written public comments concerning this proposed action should be sent by February 22, 1985 to Commander, Armament, Munitions and Chemical Command, ATTN: AMSMC-DS (M55 Functional Task Group), Rock Island, Illinois 61299.

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NEWS

US ARMY MATERIEL COMMAND
OFFICE, CHIEF OF PUBLIC AFFAIRS
5001 Eisenhower Avenue
Alexandria, Va. 22333-0001

RELEASE

202-274-8012

The Department of the Army announced today that a Finding of No Significant Impact will be published in the Federal Register on January 23, 1985 in preparation for conducting a phased assessment of the stockpile, which will provide an indication of the current and projected condition of the 476,895 M55 rockets. Statistical data obtained from the assessment will be used in conjunction with the environmental documentation to support the decision regarding the final disposition of the rocket stockpile.

Based on the results and analyses derived from the assessment and the Environmental Impact Statement (EIS), the Army will decide upon one of three options being considered regarding the future of the M55 rocket stockpile. They are: continued storage of the rockets at their present locations; transport to one or more central sites for disposal (collocation); and disposal at each storage site after construction of demilitarization facilities.

The M55 chemical rocket stockpile is located at the following six Army installations: Tooele Army Depot, Utah; Umatilla Depot Activity, Oregon;

Pine Bluff Arsenal, Arkansas; Lexington-Blue Grass Depot Activity, Kentucky; Anniston Army Depot, Alabama, and Johnston Island in the Pacific.

In order to conduct the assessment, a series of closely controlled tests will be made on random lots of rockets from these installations. Each rocket component, i.e., motor, fuze, burster, propellant, igniter, chemical agent filler, metal casing, and shipping container will be scientifically analyzed to determine its condition.

Test equipment and facilities are not available at each storage location to allow for testing operations on site, therefore, some rocket items will be transported to other Army test facilities for examination and study.

Research quantities of chemical agent samples and drained warheads will be shipped by Army aircraft, accompanied by specially trained Army personnel from the U. S. Army Technical Escort Unit, Aberdeen Proving Ground, Maryland. Each of these shipments will be packaged under the strictest safety measures in accordance with the Department of Transportation and Department of Defense shipping regulations. All other components will be free of agent and transported by commercial Department of Transportation licensed carriers.

The Chemical Research and Development Center, Aberdeen Proving Ground, Maryland; Pine Bluff Arsenal, Arkansas; Tooele Army Depot, and the Dugway Proving Ground, both in Utah, will receive the chemical agent samples for analysis. Metal parts will be shipped to the U. S. Army Material and Mechanical Research Center, Watertown, Massachusetts, for metallurgical studies, while explosive components will be analyzed at the Army's Large Caliber Laboratories located in Dover, New Jersey.

Throughout the entire assessment program, specially trained Army and civilian personnel will administer the operations. Safety and Environmental considerations will be paramount during all phases of the assessment.

Army officials expect the project to cost approximately three and one-half million dollars. All information obtained from the assessment will be included in the Draft Environmental Impact Statement which will be made available to the public.

ANNEX C TO APPENDIX L
QUESTIONS AND ANSWERS

1. Q: What is an M55 Rocket?

A: The M55 rocket is a complete round of ammunition packaged in a fiberglass shipping and firing tube. The rocket is 78 inches long, 115mm in diameter and contains either the nerve agent VX or GB. The rocket weights vary by less than a pound (56 or 56.7 lbs) depending upon the type of nerve agent fill. The rocket is stored in earth-covered and secure igloos with fuze, burster, igniter, propellant grain, and agent filled warhead installed.

2. Q: How old are the rockets?

A: The rocket was developed in the late 1950's and was type classified in 1960. Production took place in the early 1960's and the rockets were placed into storage as late as the mid 1960's.

3. Q: What kind of explosives are involved?

A: The rocket contains high explosives such as Composition B as well as a double-base propellant.

4. Q: How are the rockets stored?

A: The rockets are packaged 15 to a pallet and are stored in earth-covered, reinforced steel, concrete igloos designed for explosive storage.

5. Q: Are the rockets considered obsolete because the agent is no longer effective?

A: No. The reason that the rockets are not considered militarily useful is because their ballistic capabilities no longer meet current or projected battlefield requirements. In effect this means that the range, accuracy and reliability of the rockets are below acceptable standards. In some cases, the rockets would conceivably pose a serious threat to our own troops because of their unreliable flight characteristics.

6. Q: What is the purpose of the assessment?

A: The purpose of the assessment is to provide the Army with a clear picture of the current condition of the M55 stockpile. This will be achieved through analysis of data derived from the conduct of a series of closely controlled tests on each of the rocket components; fuze, burster, propellant, igniter, agent filler, metal casings and its shipping container. Based on the results and analysis of all the data derived from the assessment, the Army will be in a better position to determine the best course of action relative to the future disposition of the stockpile. Three courses of action are under consideration. They are: 1) continue to store the rockets; 2) demilitarize the rockets at a selected disposal site or sites; and 3) dispose of the rockets at each storage site after construction of demilitarization facilities.

7. Q: How are you taking the agent samples?

A: Agent samples are removed by drilling the warhead, inserting a syringe into the opening drawing the liquid into the syringe and placing a 10 ml sample into each of two separate glass ampules. Each ampule is then heat sealed in order to preserve its integrity for later laboratory analysis. All agent sampling will be conducted within vapor containment equipment.

8. Q: Isn't this the same as demilitarization with DATS?

A: No. This material is being removed for the purpose of studying and characterizing the properties of the agent. The residual agent not collected for sampling is then transferred to another container for continued storage.

9. Q: How are you sampling the propellant?

A: The propellant is being removed from the rocket motor assembly in an ammunition maintenance facility. The propellant is then sliced into segments, packaged and shipped for analysis.

10. Q: What are you looking for with the propellant?

A: Propellant studies are being conducted to determine whether the stabilizer which decreases the sensitivity of the propellant is still present in the amounts required to make it resistant to shock, heat and friction.

11. Q: What are the risks of low stabilizer content?

A: The propellant will become much more sensitive to ignition or detonation by shock, heat or friction.

12. Q: What are you looking for with the fuze burster, metal parts, etc.?

A: Studies of the fuze and burster are being conducted to determine if their properties have changed since initial production that would tend to degrade in continued storage of the rocket. Metal parts are being studied to determine if a corrosion process is occurring between the agent and the aluminum warhead.

13. Q: What are the hazards associated with doing the assessment?

A: As with any program involving the sampling or handling of chemical nerve agents, hazards do exist. However, the best available equipment is being utilized to conduct this assessment. All sampling operations will be conducted within vapor containment equipment. The best available experts in the field have been utilized in establishing the procedures, and a highly trained, experienced workforce will be conducting all operations associated with the assessment.

14. Q: If expedited demilitarization on site had been approved, would you still be doing this?

A: Yes, but not to the extent this plan entails. Further, under the expedited demilitarization on site option we would have assessed the rockets as part of the environmental evaluation process. It must be recognized that disposal operations could not start until 1989-90. Therefore, continued storage of the stockpile would have been required until that time. Thus an assessment of this nature would also have been required to determine the forecasted condition of the rockets to assure safety in storage.

15. Q: Are other type munitions in the stockpile filled with these bad actors? What problems have you had with them?

A: Although certain other munitions in the stockpile have experienced leakage problems, they are nowhere near the numbers of percentages encountered with the rockets. They are also much easier to containerize and do not have a complete firing train installed as do the rockets. Continued evaluation of all rounds in the stockpile is an ongoing standard operating Army procedure.

16. Q: Has the Army moved these rockets before and what did we learn?

A: The rockets were filled with nerve agent GB at Rocky Mountain Arsenal and were moved to the depots during the 1960's immediately after production. Surveillance samples were also moved during the 1960's for test firing and lab analysis during Operation Chase. Further movement of some of the rockets occurred in 1971 when all chemical munitions were removed from Okinawa to Johnston Island and the rockets were also moved in 1977 when all munitions were removed from Dugway Proving Ground to Tooele Army Depot for storage. Transportation of M55 rockets during past operations were without incident. Safety of personnel and the environmental considerations remain paramount in any such future involvements.

17. Q: What will the assessment tell you?

A: The assessment will provide scientific data which will describe in detail the condition of the rocket stockpile. The data will then be used to assess the safety issues regarding alternatives under consideration for either continued storage or disposal.

18. Q: Hasn't the decision already been made to dispose of the rocket stockpile?

A: No. The Army is considering three basic options: continued storage, collocation of stocks to selected locations where demil facilities exist or are subsequently approved for construction and disposal at each location where rockets are currently stored. A final decision regarding the best option is expected in early 1986 after full compliance with NEPA process.

19. Q: What is the Army assessing - just the nerve agent?

A: No. The Army plan calls for a detailed assessment of all individual rocket components to include the fuze, burster assembly, rocket motor propellant, igniter, nerve agent, metal parts and also the shipping and firing tube. When all these components are tested and the data analyzed, we will have a clearer picture of the makeup of the stockpile in terms of safety.

20. Q: What is the shelf life of nerve gas?

A: There is no shelf life established for nerve agent. The nerve agent contained in the M55 rocket was manufactured between 1953 and 1963, and is still considered lethal today. The assessment program will provide a better understanding of the aging profile of the agent.

21. Q: How many rockets will be tested as part of the assessment?

A: Representative samples of each component of the M55 rocket will be subjected to intensive testing and analysis to characterize the stockpile at large. The sampling plan designed for this assessment has been carefully prepared to assure that the various differences in component makeup, storage environment, production dates and manufacturers are all included.

22. Q: What factors are you going to assess when you test the nerve agent?

A: We are going to conduct a thorough chemical analysis of the agent. Four important factors are to be assessed: 1) purity levels; 2) stabilizer content; 3) acidity content; and 4) metals content. The structural integrity of the warhead casing and its ability to contain the nerve agent is directly affected by these four factors. We know from previous tests and historical data that most leaking rockets have occurred in warheads filled with relatively low agent purity levels. Data derived from this test phase will enable us to determine degradation and decomposition rates and its potential effects on metal parts.

23. Q: What problem or potential problem is there with the propellant that may affect safety?

A: The key assessment factor with respect to safety of the propellant is the amount of stabilizer remaining and its rate of loss. Stabilizer acts as a neutralizing agent and "protects" the propellant from overheating and possible self ignition. A limited number of master propellant samples were recently tested and these tests demonstrated that the stabilizer content was still in a very safe range. However, we must make sure that the condition of the propellant throughout the stockpile is verified. To achieve this goal it is planned to sample each propellant lot at all storage locations in order to fully characterize the current condition of the stockpile and project its safe storage life.

24. Q: Will all the tests be performed at the storage location?

A: No. Tests on individual components will be conducted at specially certified laboratories staffed with highly trained technical personnel. The involved laboratories are Large Caliber Laboratories, Dover, NJ for explosive components; Army Materials and Mechanics Research Center, Watertown, MA for metallurgical studies; Chemical Research and Development Center, Pine Bluff Arsenal, Dugway Proving Ground, and Tooele Army Depot for analysis of nerve agent itself.

25. Q: Why won't the tests be performed at the storage locations so that transporting these hazardous materiels can be avoided?

A: Adequate and safe test equipment and facilities are not available at all locations. We want to make sure that the tests are conducted under identical conditions to avoid introducing unnecessary variables into the tests, which could possibly invalidate the results. Shipments will be made in accordance with strict DOT and DOD safety regulations for all the materiel shipped.

26. Q: How much is this assessment expected to cost?

A: About $3.3 million.

27. Q: Isn't $3.3 million awfully expensive?

A: Every possible safety precaution will be taken during the entire program. The special equipment and safety and security resources employed at each location as samples are collected, transported, and analyzed contribute to the cost. Concern for economy of operations is secondary to concern for public safety and environmental risk.

28. Q: Will any contractors be involved in the assessment operation?

A: No. The assessment will be conducted entirely within the Army Materiel Command.

29. Q: How long after the tests are completed will it be until you tell us the results?

A: The results of the assessment will be available in mid 1985.

30. Q: Have there been problems with the rockets before?

A: Yes. Over the years, leaking warheads have been discovered. Disposal operations in the 1960's were sea dumps of concrete encased rockets. Currently sophisticated state-of-the-art equipment and facilities are being used or are being designed to completely destroy the entire rocket in a totally safe and environmentally controlled conditions.

31. Q: Is there a safety problem?

A: Anytime explosives and chemical agents are stored there are considerations regarding safety. The purpose of the assessment is to obtain, in finite detail, the exact condition of the rocket as well as each of its components. Safety problems to date have been with leaking rockets which are handled without incident or danger to surrounding areas.

32. Q: What happens if someone drops one of these rockets while taking it out of storage?

A: The rocket is packaged in a fiberglass shipping tube. In the unlikely event that a rocket is dropped, the maximum height that the rocket would fall is approximately 10 feet. Initiation of a rocket motor as a result of being dropped from a height of 10 feet or less is extremely remote. Plans exist at each depot to immediately check for any nerve agent leakage which might result from an inadvertent drop. If found to be leaking, the rocket would be immediately sealed in an air tight container.

33. Q: What's the worst case if a rocket is dropped?

A: Obviously, the worst case would be that the rocket would ignite. However, such is most unlikely because of the special safety design features of the rocket. In the unlikely event that a rocket is dropped, the rocket will be immediately checked for any leakage. If found to be leaking, the rocket will be immediately sealed in an air tight container. Emergency Response Forces already on site are trained to respond immediately. There is no danger of off-post contamination in this situation.

34. Q: When the rocket is disassembled, won't parts of the rocket be contaminated with nerve agent?

A: No. The agent is contained within the warhead only. Prior to initiating disassembly operations, the entire rocket will be monitored for agent leakage. If contamination is found during assessment of the rocket parts, it will be immediately containerized in an air-tight overpack and held for eventual disposal.

35. Q: How much of the agent will actually be moved for testing purposes?

A: Small laboratory size samples (milliliters) will be taken of each rocket assessed.

36. Q: How will the agent be transferred to the testing sites?

A: By Army aircraft accompanied by specially trained personnel from the US Army Technical Escort Unit from Aberdeen Proving Ground, MD. The shipment package is designed in excess of DOT requirements for similar shipment. The standard packaging consists of the chemical sample being sealed in a heat sealed glass ampule which is placed in a cardboard mailing tube. The tube is placed in a fiberboard container filled with cushioning and absorbant vermiculite. The container is placed in a steel cylinder filled with vermiculite. The steel cylinder has 3/8 inch thick walls and 1/2 inch cover lid with a garlock 900 gasket and eight bolts to close it. The steel cylinder is overpacked in a 3/4 inch thick plywood box for handling and tie-down.

37. Q: What is the worst case for a plane crash with agents?

A: First, the quantity of agent being transported is very small. Second, based upon the safety record of many years, a crash is most unlikely. However, if it did, the explosion and fire associated with the crash would consume the chemical agent and there would be minimal, if any, danger of agent exposure to the public.

38. Q: Doesn't that pose a great danger to the public along the route?

A: No. The movements are conducted in strict compliance with Army regulations and Public Laws (PLs) governing such matters (PL 90-122, Section 409 and PL 91-441, Section 506) (50U.S.C. 1511-1518) (AR 50-6). The Army has extensive experience using these procedures for transport of small research-type samples.

39. Q: What security precautions will be taken during the movement of agent?

A: All phases of the movement of agent will be conducted under armed escort.

40. Q: Are there other rockets containing nerve gas that are not involved in the assessment program?

A: No. The M55 is the only nerve agent rocket in the stockpile.

41. Q: Are any of these rockets located in Europe or outside of the United States? If so, are they involved in the assessment?

A: The only M55 rockets stored outside the Continental United States are at Johnston Island in the Pacific. Yes, they will be involved in the assessment.

42. Q: Do you have to file an environmental impact statement before you can move any of this stuff?

A: No. An Environmental Assessment was prepared and a Finding of No Significant Impact has been published.

43. Q: Who is in charge of this operation and where are they located?

A: The overall M55 rocket disposal program is being managed by the Army Materiel Command located in Alexandria, VA. A special task force has been established at the USA AMCCOM in Rock Island, IL, to plan and coordinate the conduct of the assessment. Special elements and other commands are also involved.

44. Q: Do the people living around the installations where the testing will be conducted know that you are doing this?

A: Yes. The Army intent to initiate planning for disposal of the rockets was first announced in February 1984. Subsequently, numerous announcements have been made. A special public announcement regarding the assessment has been released.

45. Q: Is Congress aware of this action?

A: Yes. Notification of appropriate Congressional Delegations have been made.

46. Q: Will the Governor or state/local officials be informed of the assessment?

A: Yes. The Army has notified appropriate state and local officials.

47. Q: What are the characteristics of nerve agent?

A: Nerve agents are chemicals that are extremely lethal in very small doses. The agents interfere with the transmission of nerve impulses in the body; this effect has given agents their name. The symptoms of nerve agent poisoning include pinpointing of eye pupils, dimness of vision, running nose and tightness of chest and difficulty in breathing initially and if untreated can lead to nausea, diarrhea, weakness, coma and finally cessation of breathing and death. The two types of nerve agents in the stockpile are GB and VX. GB is a liquid similar to alcohol and is most effective when inhaled or respirated; VX is more like motor oil and is most effective through skin penetration.

Appendix M

Risk Assessment

(To be Published at the Conclusion of the Assessment)